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ABSTRACT

The document describes a project to design, develop, and evaluate a set of audiovisual training modules to augment a sourcebook for special education teacher trainees and to assist trainers and curriculum developers in the design of teacher training materials. It is explained in Chapter I that the project involved the 4-D Model--Define, Design, Develop, and Diffuse. Chapter II provides a rationale for the project in terms of how the content of the proposed instructional system fulfills legitimate needs for training teachers of the handicapped. Reviewed in a third chapter are the task analysis procedures for the seven project modules: teacher-training materials development, trainee analysis, teacher-training tasks analysis, teacher-training concepts analysis, structured role play materias development, teacher-training games development, and audiovisual training modules development. Chapter IV discusses the process and results of predevelopment validation in the project. In a fifth chapter, brief summaries of trainee and context analysis and media and format selection are provided, and highlights in the design of different modules are recounted. Some major features of evaluation and revision of the seven modules are reported in a final chapter. Among appended materials are reports on materials developed by field-test workshop participants. (SBH)

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EVALUATION OF A MEDIATED PROGRAM FOR TRAINING TEACHERS OF EXCEPTIONAL CHILDREN IN INSTRUCTIONAL DEVELOPMENT

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August, 1977

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PREFACE

The Center for Innovation in Teaching the Handicapped (CITH) has evolved a symbiotic model for the systematic development of instructional materials for training teachers in special education. The development of the model was a byproduct of a number of earlier projects in the combined areas of special education, teacher behavior, and instructional technology. Procedural guidelines based on this model were written up initially as an inhouse training document; it was later expanded into a sourcebook for instructional development (Thiagarajan, Semmel, and Semmel, 1974).

The project described in this report involves the design, development, and evaluation of a set of audiovisual training modules to augment the sourcebook and to assist trainers and curriculum developers in the design of teacher-training materials. Systematic instructional development process formed both the content and the methodology for the project. The modules for the instructional system were selected to focus on three specific formats for teacher training which have potential for maximum payoffs: structured roleplay exercises, teacher-training games, and audiovisual training modules. In addition to three modules dealing with specific developmental competencies in these formats, three other modules were developed on the basic skills of learner, task and concept analyses.

A unique feature of this project is the extensive predevelopmental validation of the competencies which formed the content of the modules. Such validation was facilitated by the fact that the Center for Innovation in Teaching the Handicapped had undertaken three other projects which permitted a tryout of the recommended procedures under actual field conditions. The recommended procedures were successfully applied to the

development of concrete products and their payoffs were confirmed in terms of learning gains by teacher-trainees. The predevelopmental validation procedure also provided suitable examples and case histories which were used as illustrations in the project.

The training modules used a combination of print, audiotape, and filmstrip. A total of seven modules--an introductory module, three on general analysis skills and three on specific development skills--were produced and revised on the basis of expert suggestions and trainee feedback. The final summative field-test of the entire instructional system was conducted as a typical inservice workshop. The design of the workshop and the follow-up activities reflected conditions which are likely to be obtained under conventional teacher-training contexts in special education. Intrinsic evaluation of intermediate products of the participants indicated a high degree of transfer of analysis skills. Follow-up evaluation of participant-produced materials indicated that design, development, and evaluation skills also showed a high degree of transfer. Interviews with nonfinishers and dropouts indicated that the causes for the delay and discontinuation were environmental obstacles rather than skill/knowledge deficiencies.

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CHAPTER 1. INTRODUCTION: THE PROCESS

The heart of this project is a systematic instructional-development process which provided not only the methodology for conducting the project, but also formed the content of the competency-based instructional system. The process has been referred to as the 4-D Model and is the outcome of earlier symbiotic interactions among special educators, teacher-trainers, and instructional technologists. It has been explained in detail in a sourcebook (Thiagarajan, Semmel, and Semmel, 1974) on instructional development for training teachers of the handicapped. The process integrates the activities of analysis (the DEFINE stage of the model), production (the DESIGN stage of the model), evaluation (the DEVELOP stage of the model), and dissemination (the DIFFUSION stage of the model).

This specific project is concerned primarily with the first three stages of the 4-D model but includes incidental references to the diffusion stage. The slightly modified model is given as a flowchart in Figure 1.1. Each step of the model is briefly described below.

Stage 1: DEFINE

The purpose of this stage is to stipulate and define instructional requirements and outcomes of the project. Through various analyses, the project team prescribes objectives and constraints for the training system. The seven steps in this stage are identified and briefly described below:

1. Needs analysis. Systematic instructional development is a time-consuming process which requires various resources. It is extremely important that this process be applied to a legitimate need in the field of teacher training rather than to an educator's subjective opinion of what is good for the teachers. In this step, a number of inputs are used to

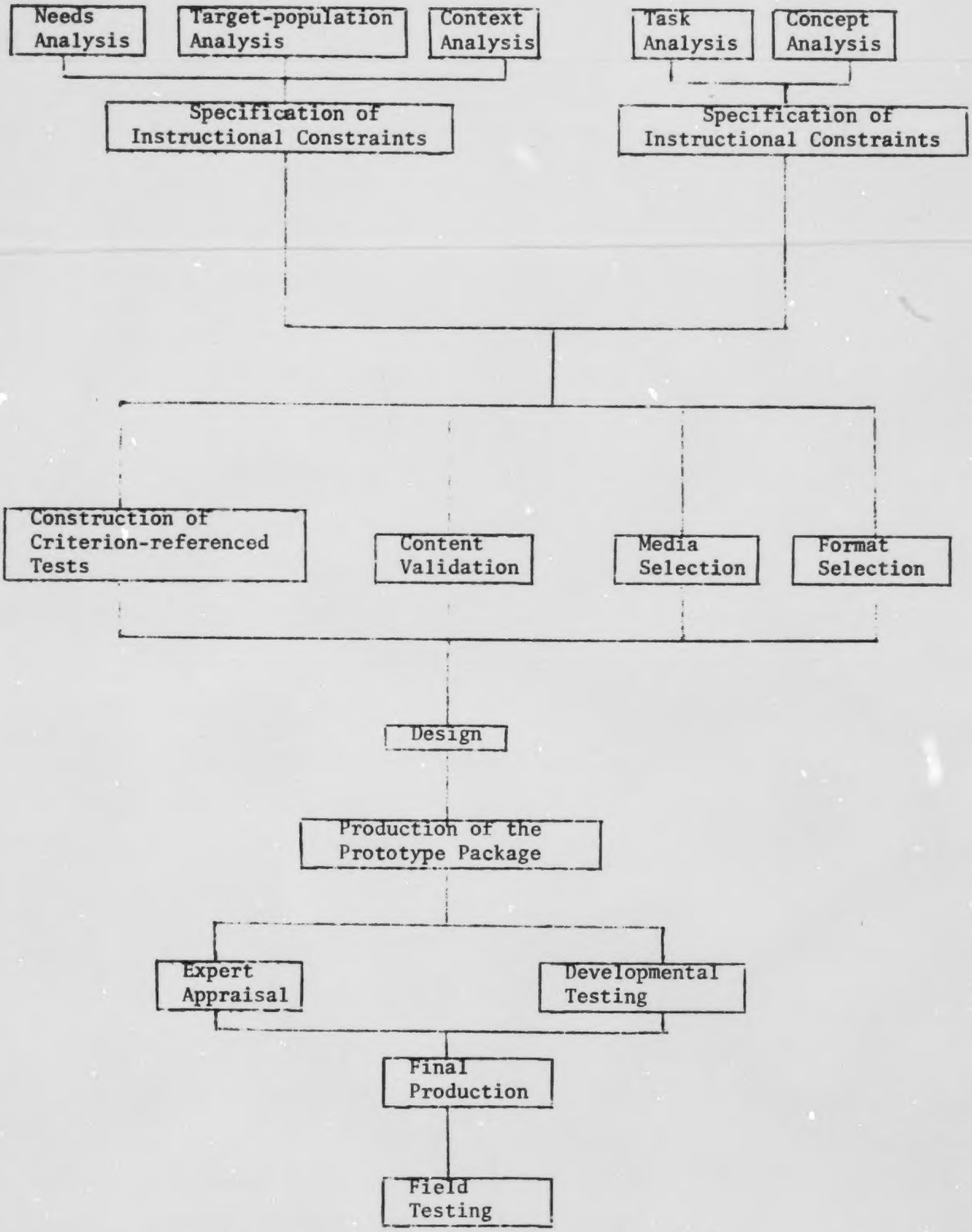

Needs Analysis
Target-population Analysis
Context Analysis
Task Analysis
Concept Analysis
Specification of Instructional Constraints
Specification of Instructional Constraints
Construction of Criterion-referenced Tests
Content Validation
Media Selection
Format Selection
Design
Production of the Prototype Package
Expert Appraisal
Developmental Testing
Final Production
Field Testing

Fig. 1.1 The 4-D model.

determine relevant needs for the project and to arrange these needs in order of priority. All significant people involved in the field of teacher-training trainers, special educators, teacher-trainees, and administrators provide the information base for this step. Such information is collected directly through interviews and questionnaires and indirectly from a survey of relevant literature and existing data (e.g., data from Project PRIME). Through an analysis of this information, various symptoms and causes of problems in the field are hypothesized. Appropriate needs are defined in terms of a discrepancy between the ideal state in special education teacher training and the actual state. These needs are arranged in a hierarchy of priorities. Those needs which lend themselves to an instructional solution are identified. From among these, the needs for which viable, but little-known solutions exist are selected to form the priority content for the proposed instructional system.

2. Target-population analysis. The target population for the instructional system designed in this project is the group of teacher-trainers. In this step, the target population is more clearly defined and other secondary target populations such as project directors, administrators, instructional technologists and commercial producers are identified. Following this, the characteristics of the target population which are likely to interact with the design and utilization of the instructional system are identified. For example, the target population's previous knowledge about competency-based teacher training is a critical variable in suggesting suitable starting points for the proposed instructional system. Such information is obtained directly through interviews and questionnaires and indirectly through a survey of literature on the characteristics of special education teacher-trainers.

3. Context analysis. For the maximum impact of an instructional system we have taken into consideration the context in which it is to be used. In this step, different situations in which the training system is to be used (e.g., inservice workshop and independent learning) are identified. These situations are analyzed to identify time, cost, and equipment constraints. Among the types of information collected in this "market" research are the likely scheduling problems, types of media equipment locally available, and the maximum cost for the materials.

4. Specification of instructional constraints. Based on these analyses, tentative specifications for the delivery of the instructional system are drawn up. These specifications, which are shared among different professional members of the project team, indicate details of desired media, instructional format, packaging, support systems, adjunct materials, and necessary evaluation instruments.

5. Task analysis. The basic competencies to be taught to the target population have been identified earlier in the needs-analysis step. During this step, each major competency is analyzed into a set of necessary and sufficient subtasks for the teacher-trainer. This analytical process involves identifying more elementary subtasks for each given major task and continuing this process until the entry level (as indicated by the target-population analysis) is reached. The tasks are then edited and revised to incorporate any missing elements and to eliminate trivial, redundant, and superfluous items.

6. Concept analysis. Although the emphasis in the instructional system is to provide teacher-trainers with practical skills, there is likely to be a set of underlying concepts necessary for the performance of these skills. In the concept-analysis step, these underlying concepts

are arranged into a suitable hierarchy. Each concept is probed to isolate its critical and variable attributes. Based on this analysis, sets of examples and nonexamples are prescribed to form the basis for instruction and criterion-referenced testing.

7. Specification of instructional objectives. Based on task and concept analysis, a set of instructional objectives for each module of the instructional system is derived in terms of specific teacher-trainer behaviors. These objectives operationalize the desired competencies and serve four different funtions:

A. Provide the base for the construction of criterion-referenced test and measuring instruments for evaluating the outcomes of the instructional system;

B. Assist in locating and retrieving suitable instructional materials that are commercially available;

C. Suggest suitable mediation strategies; and

D. Help the teacher-trainer obtain an overview of the content of the instructional system.

Stage 2: DESIGN

This stage converts the outcomes of the first stage into a prototype version of the instructional system. The six specific steps in this stage are described below:

1. Construction of criterion-referenced tests. Prior to the design of each module of the total instructional system, measures of criterion performance by the target population are developed. These measures include observation instruments, product checklists, rating scales, performance tests, and written tests. Various measures of the teacher-trainer's attitudes are developed during this step.

2. Content validation. Very often a project develops an expensive and elaborate instructional system only to realize later that the competencies are not transferable to real-life situations. Worse yet, even if these competencies transfer, they do not produce any payoffs in terms of ultimate criteria. To reduce or eliminate this possibility, the content of each instructional module in the instructional system is validated by experimentation in a controlled situation to test whether they are applicable and whether such application results in suitable payoffs.

3. Media selection. Suitable media for the instructional system are selected on the basis of the nature of the instructional objectives, the contraints of the instructional context, the nature of the target population, and the available expertise of project team members.

4. Format selection. Even within the same medium, different instructional strategies and tactics can be employed. During this step, a suitable instructional format is selected to accomodate the needs of the target population and the requirements of the training objectives.

5. Design. This step converts the earlier analyses and selections into a blueprint for the production of each module of the instructional system. It involves: planning the presentation of the instructional content through appropriate media and in the selected format, structuring various training activities into an optimal sequence, providing opportunities for the practice of different competencies, and integrating criterion-based test items to provide feedback on the progress of the teacher-trainer.

6. Production of the prototype package. In this step, actual production of the mediated modules is undertaken. This involves such activities as recording audiotapes; preparing artwork and graphics and captions; photographing and processing slides; laying out and typing printed materials; duplicating manuals; and assembling the total prototype system.

Stage 3: DEVELOP

In this stage, the prototype version of the mediated module undergoes repeated formative evaluation and revision until consistent and satisfactory performance is obtained from teacher-trainers. The effectiveness and validity of the module is then demonstrated through a field test. The four steps in this stage are described below:

1. Expert appraisal. This professional "jurying" step obtains editorial feedback from various specialists for the improvement of each mediated training module. Based upon their feedback, the module is modified to improve its appropriateness, effectiveness, usability, and technical quality. Involved in the instructional review are special educators, administrators, potential users, and specialists in the content areas. These reviewers inspect each module, its objectives, and its rationale. To obtain maximum feedback, their attention is focused on appropriateness (the extent to which the objectives and the content of the mediated module are consonant with the goals of teacher training), effectiveness (the extent to which the objectives are likely to be attained by the teacher-trainer who works through the mediated module), and feasibility (the extent to which the mediated module is applicable toward the training of teacher-trainers).

2. Developmental testing. This step involves trying out each mediated module on members of the target population (teacher-trainers) and modifying it on the basis of their feedback. A number of measuring instruments are used in this step:

A. Entry-level indicators. These measures provide information about knowledge of, attitude toward, and performance in the areas covered in the module.

B. Process indicators. These measures provide information about important events which occur during the use of the mediated module (e.g., error rate on criterion-referenced test items, trainee interest level, etc). Aspects of utility, clarity, and motivational quality of the modules are measured with these instruments.

C. Exit-level indicators. These measures are used immediately after the completion of the module to test both the mastery of knowledge and acquisition of performance skills related to the specific objectives of the module.

D. Maintenance level indicators. These measures are used at appropriate time intervals after instruction to measure the transfer of the competencies acquired from the modules and shifts in attitudes. These delayed measures indicate the effects of the interaction between newly acquired behaviors and present environments.

During initial stages of developmental testing, instructional developers are directly involved with individual target trainees. In later stages, developmental testing is conducted under actual field conditions by the evaluation staff. This formative field testing draws heavily on populations close to the developmental site in order to maintain personal contact.

3. Final production. This final step incorporates all of the revisions done in the earlier steps and prepares the materials for actual use under field conditions. Among other things, the project team assembles the entire instructional system and double checks the modules for compatibility. Various copyright and legal clearances are also obtained. A manual for the administrators of the instructional system is prepared.

4. Field testing. In this summative evaluation procedure, the instructional effectiveness of the system is tested and recorded under replicable conditions

to provide useful information to potential consumers. During this procedure the training system is tested in situations as similar to the intended use as possible. Information about the teacher-trainers involved in the field test is presented, along with the gains in their competencies, knowledge and attitudes, as evidence of the validity of the instructional system.

Summary

This chapter presented a systematic instructional development process which was used to conduct the project. The highlights of this process include systematic analysis, careful consideration of alternative delivery systems, and integration of evaluation with development. The stages and steps of this process provide the methodology of the project and the content of the instructional system. They are also used to provide the organizational structure for this report.

CHAPTER 2. NEEDS ANALYSIS

This chapter provides a rationale for the project in terms of how the content of the proposed instructional system fulfills legitimate needs for training teachers of the handicapped. Basically, the choice of the specific content is due to the demands created by increased adoption of competency-based teacher training in special education. This move has created a need for valid training materials which are individualized and performance-oriented. Because the market for such training materials is very thin from a profit point of view, it is not expected that they will be produced by commercial publishers. Hence, teacher-trainers need the competencies of designing, developing and validating their own materials to form the core of such competency-based teacher-training systems in special education. There are effective and efficient solutions available for this need from the field of instructional systems technology. Three suitable formats have been selected on the basis of suitable criteria.

Teacher training in special education in transition.

As in other fields of teacher training, special education is undergoing significant changes. In addition to the growing need to supply the nation with sufficient numbers of teachers to meet the demand for special educational services, there is an increasing emphasis on improving the quality of the teacher-training process and product. Teacher preparation programs, like the personnel they train, are being held accountable for their methods through the effects they produce; hence, the trend toward competency-based teacher certification. We are no longer satisfied that the successful completion of a list of lecture, recitation, and practicum courses is prima facie evidence of a teacher's competence in educating exceptional pupils. Just as significant, probably, is the growing tendency among trainees to question the value of course offerings, the validity of the skills and knowledge expected of them by training programs, and the competencies of their trainers. In many cases, student challenges to existing training programs have stimulated departmental evaluations of program goals and practices. Throughout the nation we find faculties examining current practices with an eye toward altering programs to effect a qualitative change in the education of exceptional children by improving the knowledge, skills, and attitudes of the personnel they train.

Systematic instructional development provides logical, creative, and empirically-tested alternatives to solve some of the problems of providing more effective training for special education teachers. Inherent in systematic instructional development is a focus on the characteristics of the learner, the nature of the skills and knowledge the learner must acquire, the stipulation of objectives in behavioral terms, and the ways in which the attainment of objectives can be measured and certified. The approach also requires the trainer to analyze and evaluate the behaviors and concepts to be taught in the training program. Perhaps most importantly, the approach directly leads to assessable alternatives to traditional methods of training teachers. The reader is introduced to different media and shown how they are relevant to the instructional process, and he is furnished with a variety of instructional formats, which, if utilized should measurably alter the form and practices currently found in most training programs. Finally, the sourcebook is concerned with the methods by which successful instructional innovations can be exported to and adopted by the larger community of teacher-educators in special education.

The Efficacy and Validity of Training Programs in Special Education

It is important to distinguish between the effectiveness of a teacher preparation program and the validity of the attitudes, skills, and knowledge derived from the program. In our view, a preparation program is effective if one can demonstrate that it has been instrumental in generating a relatively permanent change in the behavior of its trainees, and that this change is a function of the experiences the program has provided. To meet this criterion of effectiveness, the objectives of the program must be stipulated in behavioral terms, and the objectives must be appropriate to the entry behaviors of trainees. The program must describe and/or demonstrate the critical defining attributes of the training procedures so that replication can be assured. Further, the program should produce objective evidence for trainee attainment of the objectives. In other words, a program is deemed effective if it can be demonstrated that it has met its objectives as a function of a set of clearly definable experiences.

Program effectiveness is a necessary but not sufficient criterion for improving special education through the teacher's behavior. We can clearly define our training objectives in behavioral terms and meet them through effective training procedures; but the objectives may have little or no relation to successful work with exceptional pupils in the schools. For example, a training program may focus on providing a trainee with all necessary knowledge of the symptoms that identify a dyslexic child. However, this knowledge is of little use if the trainee never learns how to teach the child to read.

The training materials developed in this project do not focus on the aptness or utility of the attitudes, skills, or knowledge which training programs establish as their objectives. Rather, they assume an existing or evolving commitment to that which is important to transmit to trainees. The materials, may, however, offer the trainee considerable assistance in clarifying the ways programs might approach the difficult task of selecting training objectives that can be validated against teacher effects with exceptional children. A primary concern here is to provide teacher-trainers with a methodology that supports the development of effective training programs.

The role of training materials in a competency-based system

The typical text-and-lecture approach to teacher training is obviously not suited for the competency-based philosophy which features the following essential elements according to Elam (1971):

1. Teaching competencies to be demonstrated are role-derived, specified in behavioral terms, and are public.

2. Assessment criteria are competency-based, they specify mastery levels, and are public.

3. Assessment requires performance as prime evidence and takes student knowledge into account.

4. The student's progress rate depends on demonstrated competency.

5. The instructional program facilitates development and evaluation of specific competencies.

Elam (1971) continues to list modularization as an implied characteristic of competency-based teacher education and training materials as a related, desirable characteristic. Definitions by other educators suggest training materials are extremely important for the implementation of a competency-based teacher-training system.

In our discussions and interviews with a number of teacher-trainers and trainees in programs which are shifting over to a competency-based approach, a major expressed need has been that of appropriate instructional materials to support the program. Specifically, teacher-trainers indicated the following needs:

1. The typical textbook in special education methods does not appear to be based on specific demonstrable competencies derived from the role of the teacher of the handicapped.

2. Typical textbooks and other conventional training materials do not

specify their objectives in behavioral terms. Even if they do, they seldom coincide with the training objectives of the local program.

3. Evaluation of the trainee performance based upon the content of the textbook becomes obviously antithetical to competency-based assessment.

4. Lecture and textbook approaches do not permit individualized pacing of trainees through the instructional experiences.

5. Traditional approaches do not permit immediate incorporation of trainee feedback for the improvement of the training program.

6. A systematic and replicable program needs training materials which are accountable for consistent and satisfactory trainee performances.

7. Individualization of training requires a wide variety of training materials available from which the trainee can make his personalized selection.

8. Although trainees can learn from actual field experiences, an instructional material base is required for preparing them and following up their experiences in order to obtain optimum benefits from such an experience.

9. Trainee participation in the program is minimal. They could be increased by using advanced trainees as collaborators in producing useful instructional materials.

10. Competency-based teacher training should perceive the preparation of the teacher's career as continuous. Traditional forms of training do not facilitate such continuous progression. Training materials can be flexibly used for both preservice and inservice training of teachers.

Comments from teacher-trainees support these observations from their trainers about the need for instructional materials to form the base for the courses they take. Among the major complaints from the teacher-trainees has been a major discrepancy between the content of what they talk about and the method in which they conduct their own training. Other trainees complain that while their trainers do utilize training modules as the base for their courses, such modules are no better than apparently random chapters of the traditional textbook, with a group of behavioral objectives in front and a posttest in the back.

The solution for the paucity of training materials

The need for training materials for the support of competency-based teacher-training programs is extremely obvious from the above discussion. The solution for this need could take a number of alternative approaches. An obvious solution is to encourage commercial publishers to turn out such training materials, but this is not a viable solution because of two major reasons:

1. Commercial publishers find the market for competency-based teacher-training materials too thin to support immediate returns.

2. The specialized instructional design and evaluation skills required for the preparation of these materials are beyond the scope of commercial publishers who are more interested in producing attractive text materials.

There are many reasons to suggest that the major approach to obtaining modularized, systematically developed teacher-training materials should be through local development from special education faculty. This solution, in turn, suggests a number of related needs:

1. Incentives. New incentives have to be set up to encourage the special education faculty to devote the considerable time required for the development of such materials. Although training-material development is sometimes considered to be more scholarly than the mere teaching of courses, rewards for this activity are below those for pure research. Development and evaluation of such training materials should be considered on par with other types of research for the considerations of promotion and tenure of the junior faculty.

2. Environmental support. The systematic development of training materials requires resource committments far beyond what many teacher-training programs are currently able to afford. The trainer/developer needs released time to conduct various analysis, production, and evaluation activities. S/he needs personnel support for media production, evaluation, and secretarial help. There are many ways in which teacher-training organizations in special education (e.g., Teacher Education Division of CEC) and funding agencies (e.g., Bureau of the Education for the Handicapped) can provide financial and moral support for the trainer/developers.

3. Basic competencies. The design and development of a training material which is accountable for producing relevant and competent performance on the part of trainees requires a new set of skills on the part of the trainers. Fortunately, these skills are available from the discipline of instructional technology. Specific details about the competencies required for the systematic development of instructional and training materials are found in a number of recent books (e.g., Baker & Schutz, 1971; Briggs, 1970; Cavert, 1972; Davies, 1973; Friesen, 1971; Johnson & Johnson, 1971). However, all of these books provide information on the process of instructional development in general and not in terms of teacher-training materials in particular. Teacher-trainers can benefit from the availability of training on the specific skills of designing and developing systematic instructional materials for training teachers of the handicapped.

Mission of the Project: Production of an instructional system

To fulfill the need for providing competencies in the development of training materials to the teacher-training faculty, this project focused on the development of an instructional system on these skills. One reason for the choice of this solution is the higher probability of obtaining faster production through this training intervention as opposed to an attempt to provide increased incentives or environmental support. While the success of the mission will depend upon the availability of other support, the solution selected for this project will ensure optimum utilization of whatever incentives and supports are currently available.

The selection of developing an instructional system rather than using other conventional training techniques (e.g., workshops and courses) was due to the following reasons:

1. A packaged instructional system practices what it preaches. In other words, such an instructional system for trainers will provide a model for the desirable systems for teacher-trainees.

2. An instructional system can be disseminated more widely than training which is dependent upon individual lectures and workshop leaders. Hence, maximum cost effectiveness can be achieved for the investment in the project.

3. A packaged instructional system is flexible. It can be used with teacher-trainers in different geographic regions at individual schedules.

Obviously, training teacher-trainers on the total field of instructional technology will require enormous committments of time and resources both for the development of materials and for their utilization. Hence, the project selected a few high-payoff techniques as the instructional content for the modules of the training program. The selection of the basic techniques were based on the following criteria:

1. Is the recommended procedure likely to yield products which are suited for competency-based teacher training?

2. Can the recommended procedure be carried out within the limited time available for teacher-trainers?

3. Can the procedure be used within the limited resources available in a small-scale teacher-training program in special education?

4. Is the procedure applicable to those situations where major media production equipment and facilities are not available?

5. Are the products compatible with the requirements of a field-based program?

6. Does the procedure incorporate the performance-based assessment requirements?

7. Is the procedure amenable to an analysis of relevant on-the-job skills of a teacher of handicapped learners?

8. Can the products be organized in a modularized form so that individual teacher-trainees can structure their own schedule?

Three major formats for training materials were identified on the basis of these criteria. They are identified and briefly described below:

1. Structured roleplay materials. These materials combine the advantages of simulation and roleplay along with the predictable scheduling requirements of mediated training materials. Basically, a structured roleplay material consists of a series of authentic confrontation situations in the life of a teacher of the handicapped. Printed and audiotape materials provide simulated elements of the school environment in which such confrontations take place. By participating in a small-group roleplay which is structured and timed by the coordinating audiotape, small groups of teacher-trainees experience the feelings and emotions in that situation and acquire the appropriate interpersonal skills. Although this format is not self-instructional in the sense of independent learning by a single trainee, it is a self-contained instructional format. The coordinating audiotape and the print materials provide all the background information and discussion questions for debriefing.

2. Audiovisual training module. This basic format is selected on the basis of its flexibility and ability to cater to the needs of the individual trainee. The format consists of a set of slides (or filmstrip), an audiotape, and a response booklet. The audiotape provides the main instructional content

and employs a number of narration, dialogue, and interview techniques to provide realism. The visuals on the slides provide a classroom context to the discussion and enhance the instruction through photographs, captions, charts, and diagrams. The response book contains a number of practical exercises for the trainee during the instructional interaction and a number of follow-up activities to encourage the transfer of the skills and knowledge acquired through the module.

3. Teacher-training games. This format was selected on the basis of its motivational strength. It provides repeated opportunities for the teacher-trainees to test out various relevant strategies in a low-risk game situation and learn through the effect of immediate feedback. A number of these fast-paced game activities provide a change of pace from the independent learning of various competencies through modules.

SUMMARY

The overall mission of this project is to provide teacher-trainers with the competencies of designing, developing and evaluating three types of training materials (structured roleplay, audiovisual module and training game) for teachers of the handicapped. These three formats were selected to provide high payoffs when utilized by teacher-trainers in a competency-based teacher-training program. The selection of this content for the proposed instructional system is based on a systematic needs analysis.

CHAPTER 3. TASK ANALYSIS AND SPECIFICATION OF OBJECTIVES

At the end of the needs analysis as described in the previous chapter, the project team had identified three major training formats. These fulfill some of the needs related to the large-scale adoption of competency-based teacher training in special education. This chapter describes how the major competencies associated with the design and development of these three training formats were identified and analyzed into a set of tasks and subtasks to be mastered by the teacher-trainer. Upon completion of the activities described in this chapter, we obtained clear specifications of the scope and sequence of different modules which constitute the proposed instructional system.

Task analysis procedures

The production of training materials in the three selected formats involve sequential procedures. Although many of the production stages may be carried out simultaneously in real-life for instructional convenience, a step-by-step analysis that yielded an algorithm (Merrill, 1976) was carried out. Information for this type of task analysis was obtained from a number of different sources:

1. A large number of books dealing with general aspects of instructional design, development, and evaluation were carefully reviewed to identify the common elements in the design of these three formats.

2. Another set of books dealing with each of the three specific formats (structured roleplay, audiovisual training module, and training games) were reviewed to obtain pertinent information on the design, development and evaluation of each of the three formats.

3. A number of instructional developers in the field were interviewed and were asked to reconstruct the process they use in the design of training materials in the selected format. These developers were also observed in action as they worked through the design of their training materials.

4. Commercially available teacher-training materials in each of these three different formats were analyzed to identify their critical features. These features were used for double-checking the instructional development procedure tentatively identified on the basis of the previous analyses.

5. The project team actually undertook applications of the precedures to the design of training materials in the three formats. The object of this activity was three-fold: (1) to refine the recommended procedure on the basis of actual tryouts, (2) to validate the utility of the recommended procedure, and (3) to obtain realistic examples and models for use in the training modules. Detailed description of this procedure is provided in Chapter 4.

Outcomes of the task analysis

The initial outcomes of the analyses of these three major competencies are shown in Figure 3.1, 3.2, and 3.3:

Competency 1. Design, develop, and evaluate structured roleplay material for training teachers on a topic of your own choice.

Competency 2. Design, devlop, and evaluate a training game for teachers on a topic of your own choice.

Competency 3. Design, develop, and evaluate an audiovisual training module for training teachers on a topic of your own choice.

A comparitive study of the three analyses indicate that they all contain these common elements:

1. Trainee analysis. As the first step in the design and development process, the trainer analyzes the critical characteristics of the teacher-trainee.

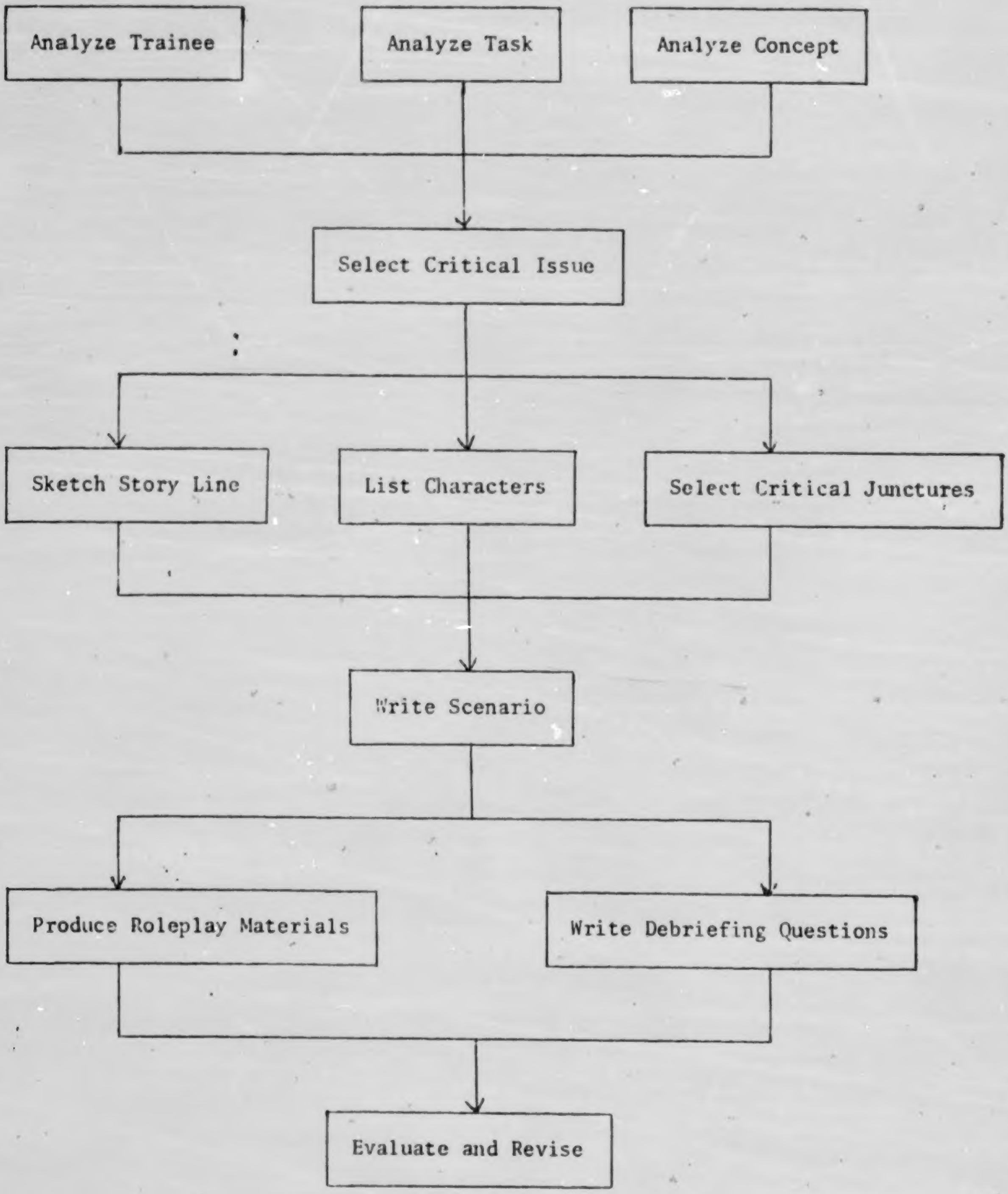

Analyze Trainee
Analyze Task
Analyze Concept
Select Critical Issue
Sketch Story Line
List Characters
Select Critical Junctures
Write Scenario
Produce Roleplay Materials
Write Debriefing Questions
Evaluate and Revise

Fig. 3.1 Analysis of the task of producing structured roleplay materials.

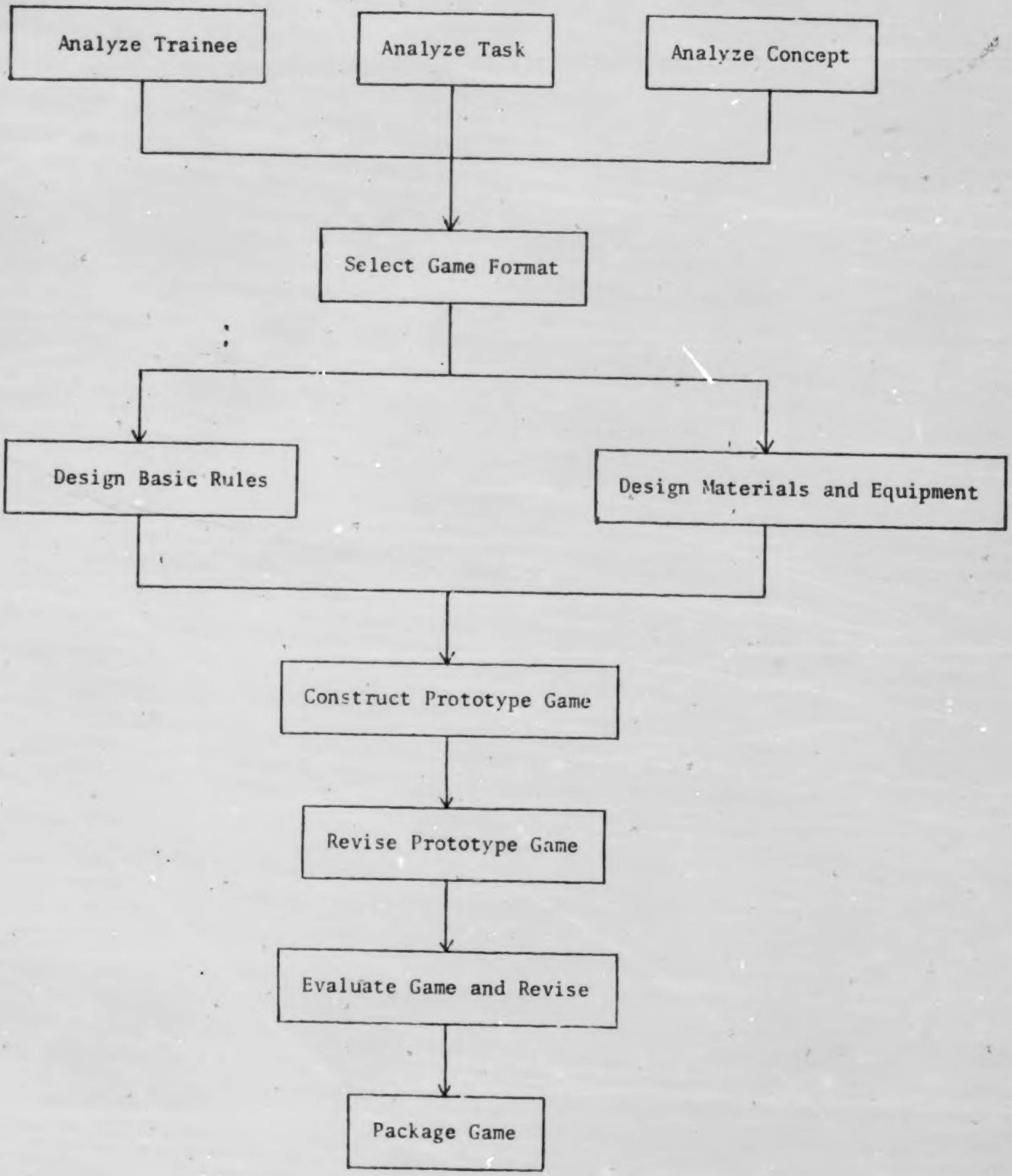

Analyze Trainee
Analyze Task
Analyze Concept
Select Game Format
Design Basic Rules
Design Materials and Equipment
Construct Prototype Game
Revise Prototype Game
Evaluate Game and Revise
Package Game

Fig. 3.2 Analysis of the task of producing a teacher-training game.

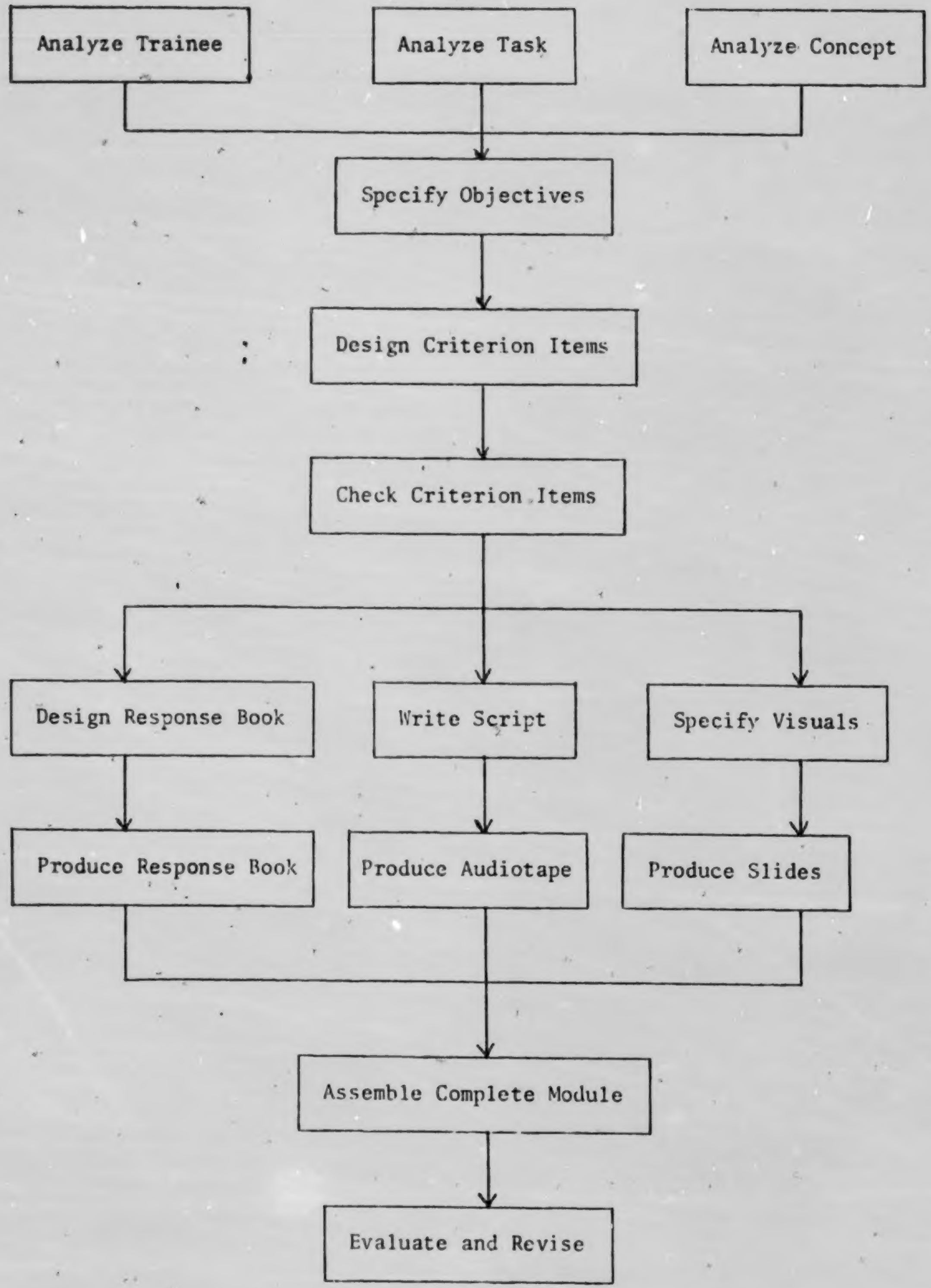

Analyze Trainee
Analyze Task
Analyze Concept
Specify Objectives
Design Criterion Items
Check Criterion Items
Design Response Book
Write Script
Specify Visuals
Produce Response Book
Produce Audiotape
Produce Slides
Assemble Complete Module
Evaluate and Revise

Fig. 3.3 Analysis of the task of producing an audiovisual training module.

2. Task analysis. The designs of all three instructional formats also include an analysis of the instructional task as an initial activity.

3. Concept analysis. This is another initial activity in which the basic concepts to be taught are analyzed into their defining attributes.

4. Evaluation and revision. This activity occurs near the end of all three analyses. It deals with the formative evaluation and modification of the training materials on the basis of their tryouts with representative teacher-trainees.

The subtasks involved in the first three of these tasks (trainee analysis, task analysis, and concept analysis) are the same irrespective of the training format. The subtasks of the evaluation/revision task differ, however, depending upon the type of training format. In other words evaluation and revision of an audiovisual module differs from the evaluation and revision of a structured roleplay.

Development of modules

To avoid the redundancy of having to reteach the same basic competencies of trainee, task and concept analyses in each of the modules, it was decided to produce a total of six modules dealing with the topics indicated in Figure 3.4:

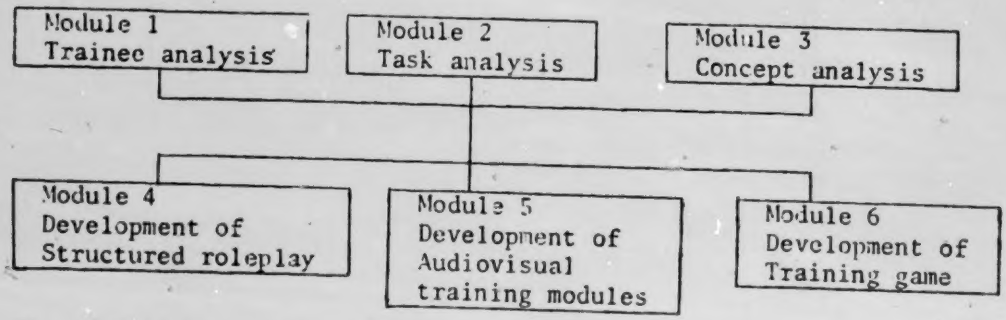

Module 1
Trainee analysis
Module 2
Task analysis
Module 3
Concept analysis
Module 4
Development of
Structured roleplay
Module 5
Development of
Audiovisual
training modules
Module 6
Development of
Training game

Fig. 3.4 Interrelationship between three analysis modules and three development modules.

The figure indicates the recommended sequence of working through the modules in the proposed instructional system. The first three modules, dealing with skills of analysis, can be used in any sequence. However, competencies from these three modules have to be mastered before the trainer can proceed to the other modules dealing with the development of the three types of training materials. The three development modules can also be used in any sequence. It is very likely that the teacher-trainer can select one of these modules based upon the type of trainee and the type of task s/he is dealing with and can implement the recommended procedure s/he has selected.

During our later evaluations, representative teacher-trainers suggested that an initial module with an overview of the instructional development procedure would be very helpful. Such a module was included in the final series. The entire instructional system now consists of the following seven modules:

Module 1. How to develop teacher-training materials
Module 2. How to analyze your trainee
Module 3. How to analyze teacher-training tasks
Module 4. How to analyze teacher-training concepts
Module 5. How to develop structured roleplay materials
Module 6. How to develop teacher-training games
Module 7. How to develop audiovisual training modules

Task analysis charts for the first four modules are given in Figures 3.5 and 3.8.

Behavioral objectives for the modules

The final outcome of various analyses yielded a set of specific behavioral objectives. The general and specific objectives for each module in this instructional system are given in Figures 3.9 to 3.15.

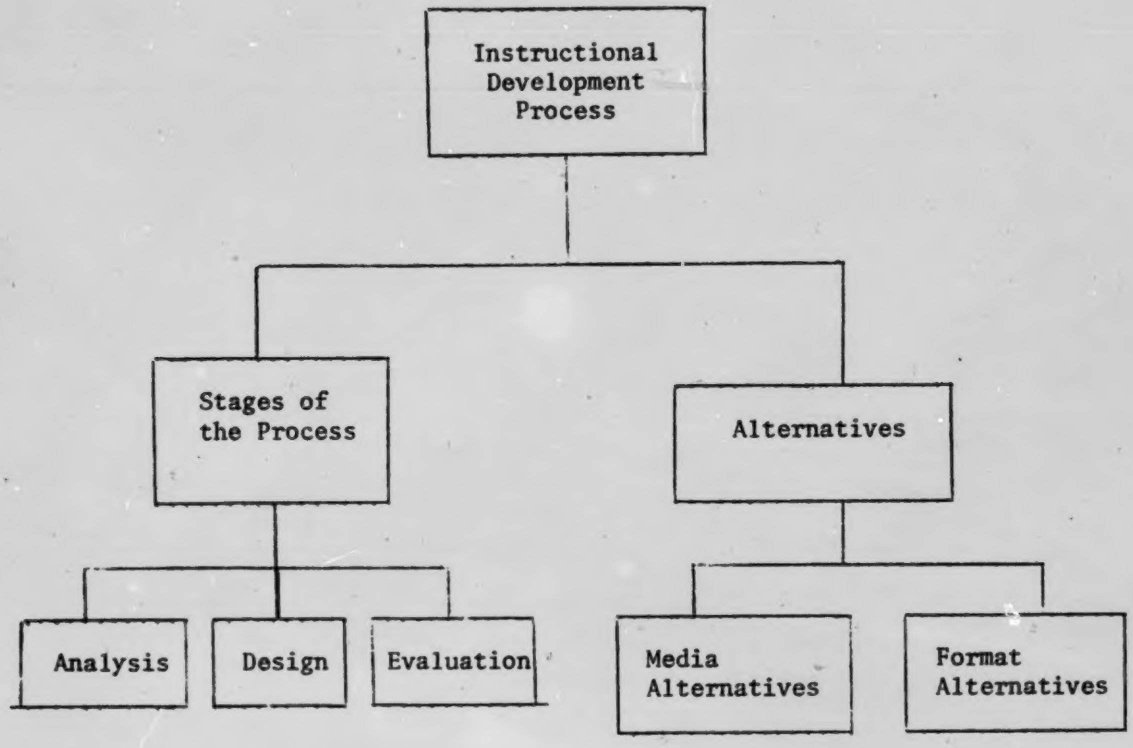

Instructional Development Process
Stages of the Process
Alternatives
Analysis
Design
Evaluation
Media Alternatives
Format Alternatives

Fig. 3.5 Analysis of the task for the overview module.

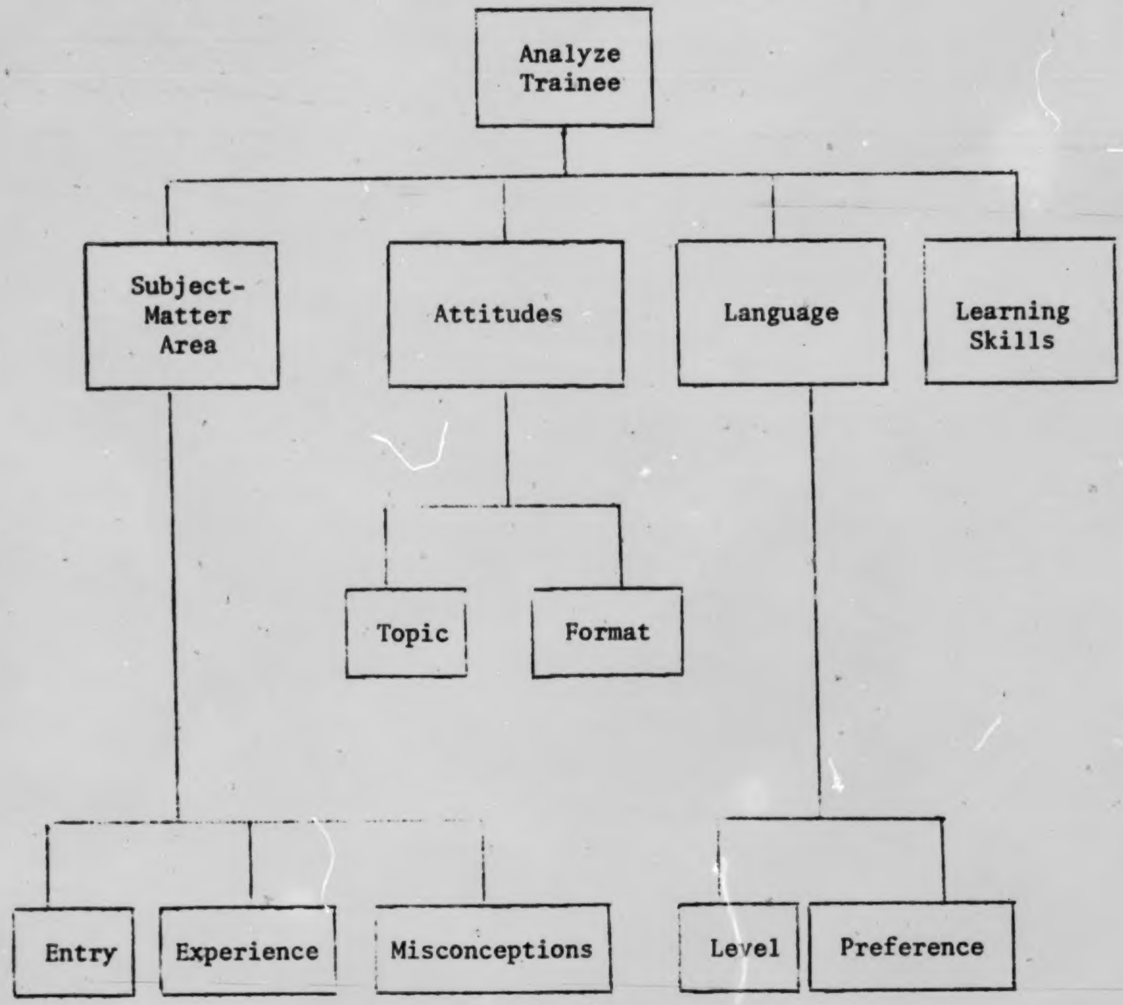

Analyze Trainee
Subject-Matter Area
Attitudes
Language
Learning Skills
Topic
Format
Entry
Experience
Misconceptions
Level
Preference

Fig. 3.6 Analysis of the task of learner analysis.

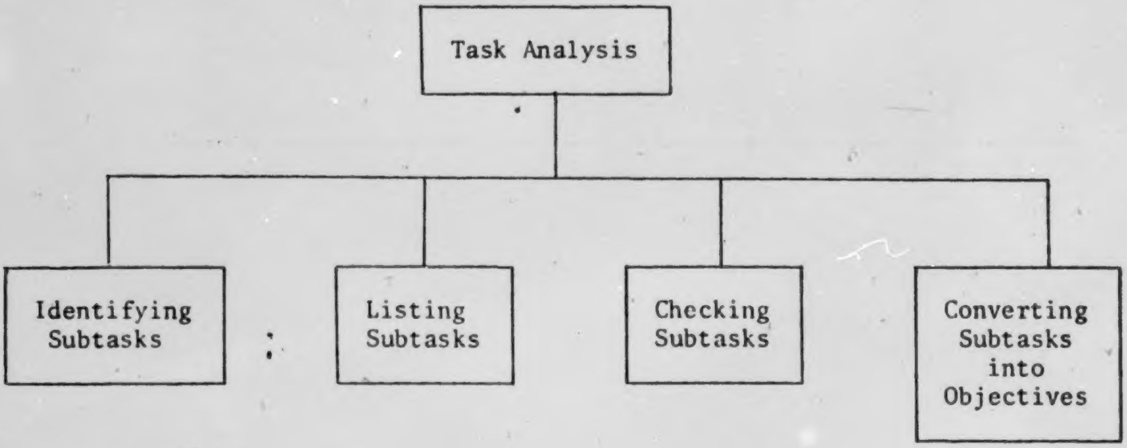

Task Analysis
Identifying Subtasks
Listing Subtasks
Checking Subtasks
Converting Subtasks into Objectives

Fig. 3.7 Analysis of the task of task analysis.

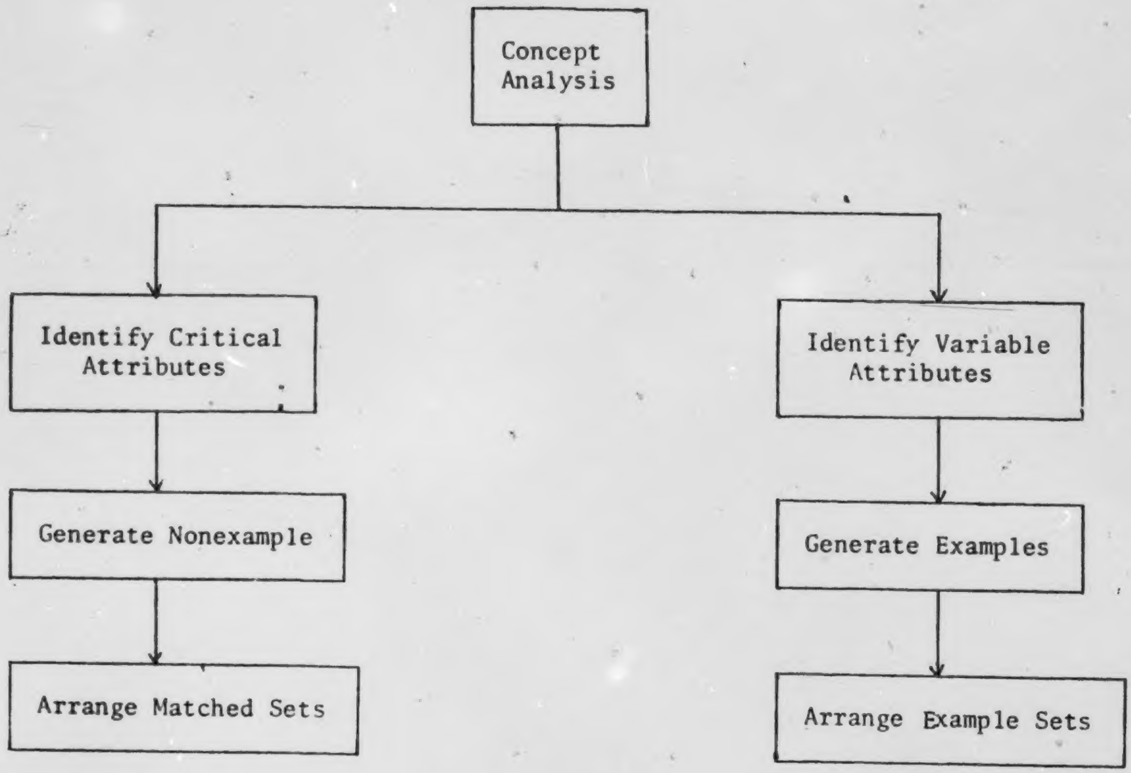

Concept Analysis
Identify Critical Attributes
Generate Nonexample
Arrange Matched Sets
Identify Variable Attributes
Generate Examples
Arrange Example Sets

Fig. 3.8 Analysis of the task of concept analysis.

MODULE 1. HOW TO DEVELOP TEACHER-TRAINING MATERIALS

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to outline and describe various stages in the process of developing teacher-training materials. S/he will also realistically plan a developmental project.

SPECIFIC OBJECTIVES:

1. DISCUSS the role of instructional development in competency-based training of teachers of handicapped children.

2. BRIEFLY DESCRIBE the purposes of analysis, design, and formative evaluation stage of instructional development.

3. OUTLINE various steps in the systematic development of teacher-training materials.

4. DISCUSS the role of media in the design of teacher-training materials. LIST media which are especially useful for teacher-training materials.

5. GIVE EXAMPLES of different instructional formats suited to the design of teacher-training materials.

Fig. 3.9 Training objectives for Module 1.

MODULE 2. HOW TO ANALYZE YOUR TRAINEE

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to identify those characteristics of the teachers which are likely to interact with the design of training materials.

SPECIFIC OBJECTIVES:

1. EXPLAIN the role of trainee analysis in the process of instructional development of teacher-training materials.

2. COLLECT and ANALYZE information on trainee characteristics from trainers and trainees, using questionnaires and interviews.

3. COLLECT information on the trainees' entry level on the subject-matter area, background experiences and popular misconceptions.

4. COLLECT information on the attitudes of teacher-trainees toward the instructional task and the training format.

5. COLLECT information on the language level and preferences of teacher-trainees.

6. COLLECT information on teacher-trainees' ability to handle the format of the training material.

Fig. 3.10 Training objectives for Module 2.

MODULE 3. HOW TO ANALYZE TEACHER-TRAINING TASKS

GENERAL OBJECTIVE: Upon completion of this module, teacher-trainers will be able to analyze a teaching competency into a hierarchical set of necessary and sufficient subtasks and derive specific behavioral objectives from this set.

SPECIFIC OBJECTIVES:

1. DESCRIBE various steps in task analysis.
2. ANALYZE a teaching competency of your own choice into a number of subtasks.
3. LIST subtasks in the form of a chart or an outline to indicate the hierarchy.
4. CHECK the adequacy of task analysis and REWRITE incomplete, superfluous, and/or redundant items.
5. CONVERT task analysis statements into specific behavioral objectives.

Fig. 3.11 Training objectives for Module 3.

MODULE 4. HOW TO ANALYZE TEACHER-TRAINING CONCEPTS

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to analyze a given concept in the curriculum of handicapped children, identify critical and irrelevant attributes, and create a set of examples and nonexamples to teach the concept.

SPECIFIC OBJECTIVES:

1. ANALYZE a teacher-training concept and identify its critical and variable attributes.
2. GENERATE a set of divergent examples, using the list of variable attributes of the concept.
3. GENERATE a set of close-in nonexamples, using the list of critical attributes of the concept.
4. ARRANGE the examples of a concept in order of decreasing saliency.
5. MATCH each nonexample of a concept with a suitable example.
6. DESIGN a protocol material to teach the concept to teachers.

Fig. 3.12 Training objectives for Module 4.

MODULE 5. HOW TO DEVELOP STRUCTURED ROLEPLAY MATERIALS

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to develop structured roleplay materials on a controversial issue for use by teachers.

SPECIFIC OBJECTIVES:

1. IDENTIFY a critical issue in teaching handicapped children which lends itself to the use of structured roleplay format.
2. ANALYZE the selected issue and IDENTIFY positive and negative arguments related to it.
3. SKETCH a storyline that incorporates the natural events related to the selected topic.
4. IDENTIFY and LIST those characters who have a significant role to play in the course of events related to your selected topic.
5. SELECT critical junctures where the significant characters are likely to confront each other.
6. WRITE a scenario for the roleplay based upon your storyline, list of characters and the critical junctures.
7. PRODUCE actual roleplay materials (name tags, role descriptions, and observer's records).
8. WRITE debriefing questions for use during post-roleplay discussions among teachers.
9. TRY OUT the roleplay with small groups of representative teachers and REVISE the material to produce consistent and satisfactory results.

Fig. 3.13 Training objectives for Module 5.

MODULE 6. HOW TO DEVELOP TEACHER-TRAINING GAMES

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to develop a game for training teachers on an instructional topic of his/her own choice.

SPECIFIC OBJECTIVES:

1. SELECT a suitable format for the training game based upon information from trainee, task, and concept analyses.
2. DESIGN basic rules for the game to suit the format and the instructional needs.
3. DESIGN game materials and equipment.
4. CONSTRUCT a prototype version of the teacher-training game.
5. MODIFY game materials and equipment and REVISE the rules by using a checklist on game design.
6. TEST the training game with representative teachers and MODIFY the game to increase its instructional and motivational effectiveness.
7. PACKAGE the game and adjunct materials for dissemination.

Fig. 3.14 Training objectives for Module 6.

MODULE 7. HOW TO DEVELOP AUDIOVISUAL TRAINING MODULES

GENERAL OBJECTIVE: Upon completion of this module, the teacher-trainer will be able to produce an audiovisual training module on a suitable topic of his/her own choice.

SPECIFIC OBJECTIVE:

1. SELECT a topic which is appropriate to your trainees and PERFORM a task analysis of the selected topic.
2. From the task analysis, SPECIFY a set of behavioral objectives for your audiovisual module. CHECK these objectives against a checklist and MAKE suitable revisions.
3. DESIGN criterion items to match each objective of the audiovisual module.
4. VERIFY the appropriateness of the criterion items according to a given checklist.
5. LIST items other than the criterion items to be included in the response book.
6. SPECIFY visuals to accompany the script, indicating the type of visual. VERIFY these visuals against a checklist and MAKE suitable revisions.
7. Using a standard scripting format, WRITE a script which teaches toward each criterion item of the response book.
8. PRODUCE an audiotape for the audiovisual module.
9. PRODUCE a set of slides for the audiovisual module.
10. ASSEMBLE all components of the audiovisual module ready for implementation with trainees.

Fig. 3.15 Training objectives for Module 7.

SUMMARY

A systematic task analysis for the project identified three basic competencies (learner analysis, task analysis and concept analysis) and three specific tasks (developing structured roleplay materials, developing training games and developing audiovisual training modules). Each of these tasks were further analyzed to identify appropriate sets of necessary and sufficient subtasks. Additional task analysis was undertaken for an introductory module. A set of behavioral objectives were derived from each of the task analyses.

CHAPTER 4. PRE-DEVELOPMENTAL VALIDATION

As indicated in the previous chapter, specific objectives for seven modules of the proposed instructional system were obtained through systematic task analyses. Rather than immediately beginning the design and development of the training modules, an intermediate validation process was undertaken. In this process, the contents of the seven modules were actually implemented for the production of sample teacher-training materials in each of the three training formats selected earlier.

Pre-development validation during the early stages of this project was facilitated by the fact that CITH was working on three additional funded projects involving the three training formats. Although different personnel worked on these projects, the use of the same core staff enabled us to undertake this symbiotic activity. From the main project came the procedural rules to be used for the design of an instructional game in the ANTICIPATION project, structured roleplay materials in the MAINSTREAMING project, and audiovisual training module in the TIPS FOR TEACHERS project. Feedback on the relevancy, feasibility, practicality, and appropriateness from these three projects enabled the first project team to refine their task analysis and come up with more practical procedures.

In addition to validating the procedures, this activity provided authentic case histories of instructional development in the three chosen training formats. For example, the module on the development of structured roleplay "walks" the teacher-trainer through the production of actual roleplay materials and provides a step-by-step analysis of how this material was gradually developed. The example used is the product from the MAINSTREAMING project. Similarly, the example of an ANTICIPATION game was used to describe and illustrate the procedure for constructing a teacher-training game. Finally, the module on producing an audiovisual training module used an actual case history from the TIPS FOR TEACHERS project. During our evaluation of the instructional system many teacher-trainers commented favorably upon our use of these case studies.

Figure 4.1 indicates the interrelationship among different instructional development projects at CITH which provided pre-development validation and authentic examples during this stage:

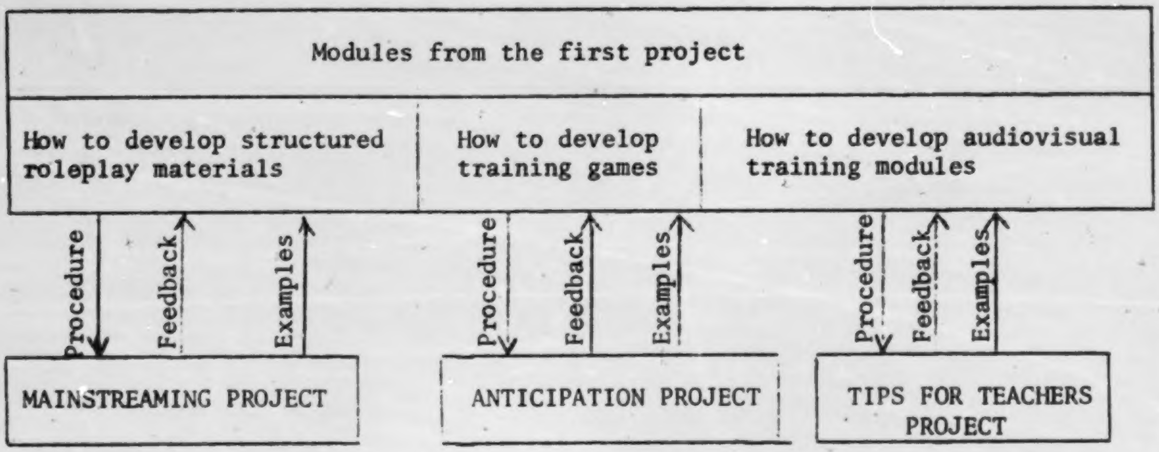

Modules from the first project
How to develop structured roleplay materials
How to develop training games
How to develop audiovisual training modules
Procedure
Feedback
Examples
Procedure
Feedback
Examples
Procedure
Feedback
Examples
MAINSTREAMING PROJECT
ANTICIPATION PROJECT
TIPS FOR TEACHERS PROJECT

Fig. 4.1 Interrelationships among this project and other projects at CITH which permitted pre-development validation.

PRE-DEVELOPMENT VALIDATION OF THE PROCEDURE FOR DEVELOPING STRUCTURED ROLEPLAY MATERIALS

The procedure for preparing structured roleplay materials was validated through the MAINSTREAMING project. The outcome of the latter project was a structured roleplay material that depicts the problems and rewards of mainstreaming. Data on the production and effectiveness of this teacher-training material is briefly summarized below as evidence of the practicality and validity of the recommended procedure.

Developmental Procedure

The MAINSTREAMING project was undertaken on the basis of a needs analysis which indicated that many teacher-trainees are apprehensive about the reintegration of mildly handicapped children in regular classrooms. A large share of this need required a presentation of the arguments for and against mainstreaming. This fact suggested the suitability of some form of roleplaying. The procedure for developing a structured roleplay was applied to this situation.

1. The issue of mainstreaming was analyzed to identify opinions and arguments which supported or rejected the movement. These arguments were obtained through interviews with classroom teachers, parents, handicapped children, and principals. They were augmented by a selective review of the literature on mainstreaming. The resulting collection of arguments suggested major themes for the structured roleplay material.

2. A storyline was devised for the structured roleplay. It was decided that the roleplay should begin at a point in time slightly before the decision to mainstream mildly handicapped children into regular classrooms is implemented. The story should then involve various concerns of the teachers and the parents and should terminate sometime after children have been mainstreamed in the regular classrooms.

3. The developmental procedure next involved identification of the key characters in the story. It was decided that these characters should include the following:

a. principal

b. a special education teacher who is against mainstreaming

c. another special education teacher who is for mainstreaming

d. a regular teacher who does not want any handicapped children in her classroom

e. a regular teacher who is willing to accept handicapped children

f. a parent who wants his handicapped child to be mainstreamed

g. another parent who wants his handicapped child to stay in the special classroom

h. a few handicapped children

In addition to identifying all significant individuals involved in mainstreaming, this list also ensured a balance of positive and negative opinions about the movement.

4. The next step in the development of the structured roleplay material involved identifying critical junctures in the story which brought about confrontations among various characters. The following were the critical junctures selected by the developers:

a. A meeting chaired by the principal and attended by two special class teachers and two regular class teachers. The meeting discussed a mandate for mainstreaming from the school system administrators.

b. A confrontation among two parents of handicapped children, two teachers from the regular classroom who are to accept these children, and a resource teacher.

c. The day before the mainstreaming move in a special education classroom, the teacher tries to prepare two of the children for the move into regular classrooms. Two other handicapped children are present, one disappointed and the other relieved about being left out.

d. A week after the mainstreaming move in a regular classroom, a test has been returned to all pupils, and the teacher has to leave for a few minutes. This segment depicts the teasing of the handicapped child by his peers.

5. In the next step of the development procedure, a scenario for each of the four critical junctures were written. This scenario introduced the roleplayers to a fictitious school in Polymer, Indasota, and provided a brief synopsis of the incidents which preceded the mainstreaming move. The scenario also introduced each of the four critical junctures and outlined the role to be played by each of the five teachers.

6. The next step involved the production of actual roleplay materials. In this step, the basic scenario was recorded on an audiocassette. The tape also contained silent periods for the roleplay among the participants and acted as a timing device. Five different roleplay booklets were also produced. Each booklet contained name tags, role descriptions, and simulated memos for each player.

7. The next step involved writing debriefing questions. These questions were provided at the end of each segment to require participants to think back on their roleplay experiences and to share their feelings and emotions with each other. The debriefing questions were provided in the booklet for each player.

8. The entire roleplay package was formatively evaluated by representative groups of teachers. On the basis of their feedback, modifications were made to the material to improve its use and effectiveness. The following list indicates the nature of these modifications:

a. The total number of roleplay sessions were changed from five to three.

b. Participants were asked to play only one session at a time rather than attempt all sessions at a single sitting.

c. The assignment of different roles to different players was made more specific.

d. Instructions were provided on how to handle smaller or larger groups of participants.

e. A final roleplay session which provided a happy ending was eliminated as being too contrived.

f. A planning session was added to the end of the roleplay sessions to provide an opportunity for the participants to devise various strategies for increasing the likely success of mainstreaming.

This process verified the procedure recommended on the basis of the task analysis. Although some minor changes were made in the procedure on the basis of the tryout, the general procedure was found usable in a teacher-training context. However, our pre-development was continued in order to establish the effectiveness of the resulting instructional material. This was undertaken by an independent evaluation unit at CITH. The results have been reported elsewhere (Brownsmith, Field and Guskin, 1976). A brief summary of the evaluative findings are given below as evidence of the validity of the content being taught in one of the modules of this project.

Population

The subjects for this study were 263 participants in 11 workshops. Nine of the workshops involved regular and special class teachers in Texas. The two exceptions were a Martinsville, Indiana group of 21 paraprofessionals; and a Louisville, Kentucky group of 10 special class teachers. Further descriptive data on the sample are presented in Table 4.1. All of the Texas workshops were conducted in school systems that were currently mainstreaming

Site	Louis-ville, KY	Bryan, Texas	College Station, Texas	Bryan, Texas	Mont-gomery, Texas	Willis, Texas	Region XII, Texas	Martins-ville, Indiana	Mont-gomery, Texas	Porter, Texas	Region XII, Texas
Date of Workshop	5/13/74	3/13/74	4/17/74	4/23/74	4/24/74	8/14/74	8/16/74	7/9/74	4/19/74	5/14/74	10/3/74
N	10	38	17	29	23	25	42	21	10	21	27
Age											
mean	32.2	33.8	21.2	37.6	41.36	37.1	38.0	30.4	30.1	29.7	34.2
range	23-66	21-65	19-23	23-64	24-58	21-65	21-58	22-45	23-50	23-59	24-55
Sex											
male	1	8	3	4	10	8	13	0	2	2	18
female	9	30	14	25	13	17	29	21	8	19	9
Degrees Held											
Working on BA	0	0	16	0	0	0	0	20	0	0	0
Bachelors	5	16	1	17	8	15	17	1	8	19	10
Masters	5	13	0	0	14	9	23	0	1	2	16
Ph.D.	0	0	0	9	1	0	1	0	0	0	1
No info.	0	9	0	3	0	1	1	0	1	0	0
Years Experience											
Spec.Ed.	4.1(10)	2.0(4)	0	3.9(8)	3.8(8)	5.6(5)	6.2(8)	1.0(1)	3.0(9)	1.5(8)	5.0(7)
Reg.Ed.	10.4(3)	17.3(30)	0	14.4(22)	9.4(18)	9.2(18)	12.5(38)	2.5(21)	6.6(7)	5.2(14)	6.9(24)
Admin.	9.1(1)	2.0(6)	0	7.5(6)	12.0(9)	14.8(5)	2.3(11)	2.0(1)	0(0)	4.2(5)	4.4(12)
Grade Level											
Primary		18		10	5	3	13	20	5	13	4
Intermediate		0		6	4	10	20	1	3	0	7
Secondary		0		1	5	6	[illegible]	0	0	2	9
Spec.Ed.	10	12		7	2	3	4	0	0	3	2
Other		6		2	5	3	0	0	0	1	1
No info.		2		3	2	0	1	0	2	2	4

Table 4.1 Demographic data summary.

handicapped children or preparing plans to mainstream handicapped children.

Measures

One instrument was used in the second stage of the formative evaluation of the mainstreaming package. The questionnaire was developed by CITH staff to obtain indications of: (1) interest in the mainstreaming package, (2) difficulties encountered while going through the package, (3) teachers' perceptions of their future needs in helping to cope with mainstreaming. The questionnaire was completed at the conclusion of the mainstreaming workshop.

Administration of the Workshops

The workshops which took place between May and October, 1974, generally were used as inservice training presented in one three-hour session. The subjects went through all modules according to instructions on the tapes. The Martinsville workshop was conducted by one of the developers of the mainstreaming package; all other workshops were conducted by persons unfamiliar with the mainstreaming package.

Results

Semantic differential scales. Table 4.2 indicates that the mean ratings for all subjects on the materials were very close to 2.0 (1.0 most favorable, 6.0 most unfavorable) on most of the scales: 1.93 -22.15 on 9 of the 12 scales, 1.76 on "interesting-boring," 2.36 on "clear-unclear," and 2.40 on "efficient-inefficient." The means are graphically portrayed in Figure 4.2. If one combines the three unfavorable categories (4, 5, 6), the percentage of unfavorable response for the total sample ranges from 8.1% negative ("dull") to 17.5% negative ("unclear"). In 7 of the 11 workshops, 10% or less of the participants answered negatively on 10 of the 12 scales. In 6 workshops, 10% or less

Table 4.2

Ratings of Materials by all Respondents (N=263) on Semantic Differential

(Most Favorable Rating =1, Least Favorable = 6)

Scale	Mean Rating	% Unfavorable Response (4, 5, 6)
clear-unclear	2.36	17.5
appropriate-inappropriate	1.97	9.5
practical-unpractical	2.02	12.1
interesting-boring	1.76	7.1
useful-useless	2.03	11.3
effective-ineffective	2.15	9.1
efficient-inefficient	2.40	13.8
beneficial-not beneficial	2.06	11.4
valuable-valueless	2.10	12.1
flexible-inflexible	2.12	11.0
stimulating-dull	1.93	8.1
relevant-irrelevant	2.02	11.7

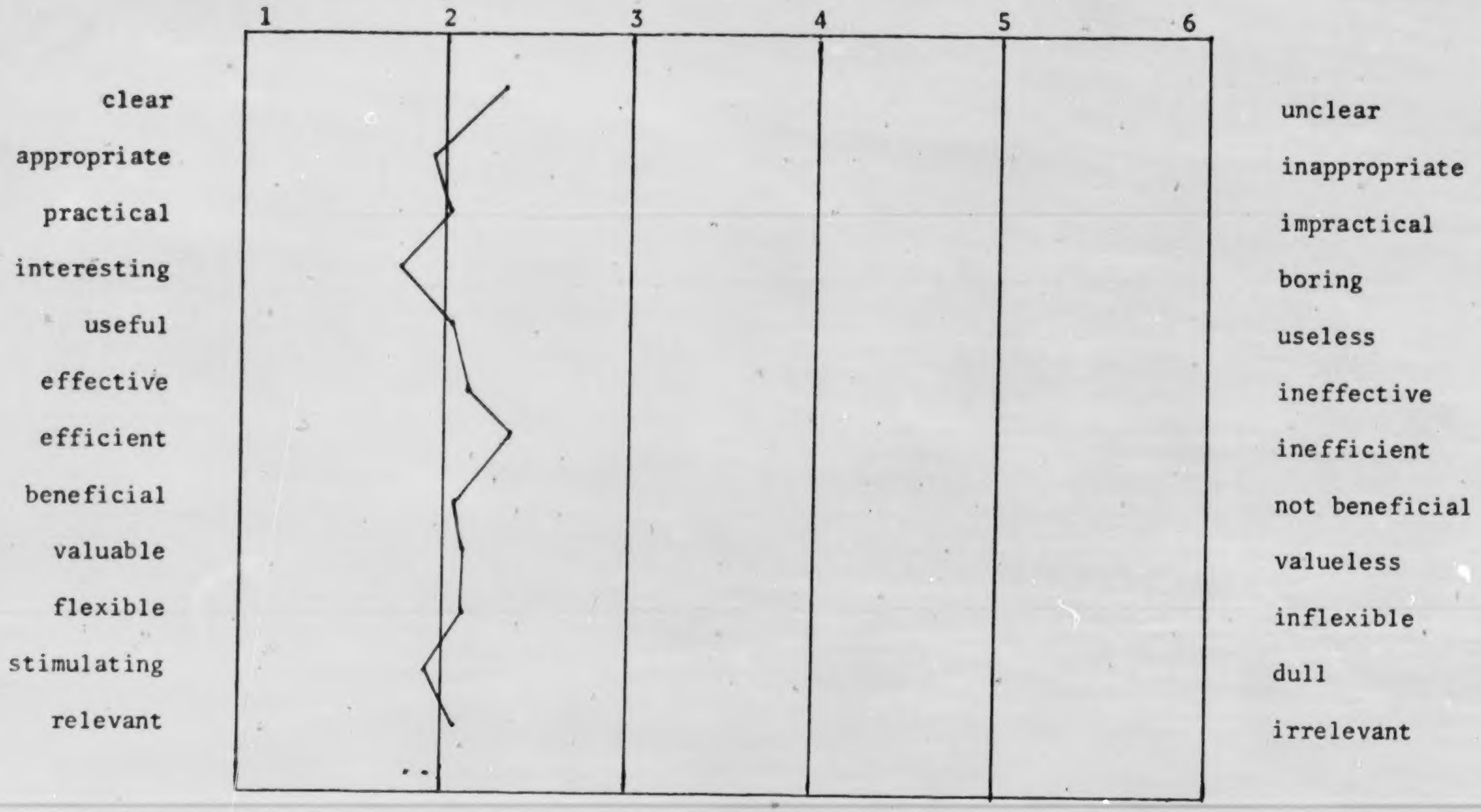


Figure 4.2: Ratings of Materials on Semantic Differential Scales (N=263)

answered negatively on the inflexibility scale, while in 4 workshops, 10% or less answered negatively on the inefficiency scale. For every scale item, at least one group showed no negative responses at all. For the item "boring," 6 of the 11 groups showed no negative responses.

Other responses to materials. Ninety-five percent of the respondents answered that the materials were "easy to use," and 89% agreed that the roleplaying instructions were understandable.

Overall assessment of experience. Two items included in the evaluation instrument can be used as an index of the overall subjective assessment by participants concerning the value of the experience. Ninety percent indicated they would "definitely" or "probably" recommend that others go through the roleplaying experience. When asked whether the workshop had changed their awareness of the complexities, problems, and issues of mainstreaming, 35% of the participants indicated their awareness had "increased considerably," 48% responded "increased slightly," and 14% answered "stayed the same".

The range of reaction to these two items for different workshop groups is shown in Tables 4.3 and 4.4. Table 4.3 shows that, for six of the 11 workshops, no respondents indicated they would probably or definitely not recommend the workshop to others, while the two least favorable groups had 16% and 18% negative reactions. Table 4.4 shows that over 80% of the participants in the workshops indicated that their awareness of mainstreaming had increased.

Written Comments on Evaluation Questionnaire

Participants were asked to write in suggestions for improving the materials. The most frequent suggestions (see Appendix B) were: the time allowed for discussion sessions was too long (13 comments), they

Table 4.3

Percentage of Participants in each Workshop Checking Each Response to the Question:

"Would You Recommend that Personnel Who Missed this Session or Those from Other Schools should have the Opportunity to go through these Roleplaying Situations?"

Workshop	Number	Definitely	Probably	Probably Not	Definitely Not	No Answer
A	10	60.0	40.0	0.0	0.0	0.0
B	38	23.7	52.6	13.2	5.3	5.3
C	17	70.6	29.4	0.0	0.0	0.0
D	29	58.6	34.5	0.0	0.0	6.9
E	23	69.6	30.4	0.0	0.0	0.0
F	25	48.0	32.0	16.0	0.0	4.0
G	42	23.8	59.5	11.9	0.0	4.8
H	21	28.6	71.4	0.0	0.0	0.0
I	10	70.0	20.0	10.0	0.0	0.0
J	21	47.6	47.6	4.8	0.0	0.0
K	27	70.4	25.9	0.0	0.0	3.7
Total	263	47.1	43.0	6.1	.8	3.0

Table 4.4

Percentage of Participants in each Workshop Checking Each Response to Question:

"As a Result of the Workshop my Awareness of the Complexities, Problems and Issues of Mainstreaming has:"

Workshop Group	Total Number	"Stayed the Same"	"Increased Slightly"	"Increased Considerably"	No Answer
A	10	10.0	50.0	40.0	0.0
B	38	18.4	52.6	23.7	5.3
C	17	5.9	29.4	64.7	0.0
D	29	17.2	34.5	41.4	6.9
E	23	13.0	47.8	39.1	0.0
F	25	0.0	68.0	32.0	0.0
G	42	26.2	42.9	19.0	11.9
H	21	14.3	42.9	42.9	0.0
I	10	10.0	80.0	10.0	0.0
J	21	23.8	47.6	28.6	0.0
K	27	0.0	44.4	55.6	0.0
Total	263	14.1	47.5	35.0	3.4

needed more information beforehand (10), and the directions were confusing (8).

In answer to the question "what did you like about this workshop?", the most frequent answers were: the roleplaying (29), interesting, enjoyable (24), made me aware of the feelings of others (23), group participation, discussions (17), and aware of the problems and issues (15).

When asked what participants disliked about the workshop, the most frequent responses were: the workshop was too long, the pauses were too long, and/or there was too much discussion time (22 responses); the instructions were confusing and/or not specific (19); and they needed more time (10).

VALIDATION OF THE PROCEDURE FOR DEVELOPING TRAINING GAMES

The procedure for developing training games underwent pre-development validation through its application to the ANTICIPATION project. The production of a training game on anticipation was taken as evidence of the practicality of the recommended procedure; the effectiveness of the game was used to establish the validity of the procedure.

Developmental Procedure

The following is a brief summary of how the recommended procedure from this project was applied to the production of training games on the ANTICIPATION project:

1. A concept analysis of "understanding of a handicapped child" resulted in the identification of the critical indicator of such understanding. This indicator is the teacher's ability to make accurate predictions of a child's responses to different instructional demands. The nature of this concept suggested the use of a training game.

2. An analysis of teacher-trainees provided valuable information on their background and experience and their preferences to different types of games.

3. Based on the previous analyses, a simple tic-tac-toe game format was chosen as the framework for the training game.

4. The basic rule for the game was worked out to require teacher-players to score by making accurate predictions about handicapped childrens' successes on various test items. The rules were designed to require the players to take into account such variables as the children's IQ levels, ages, and different subject-matter areas.

5. A large number of cards with questions from the subject-matter areas of reading, language arts, arithmetic, and work-study skills were prepared. On the back of these cards normative data from different children (grouped by age and IQ levels) were provided. A game board with a 3X3 grid and poker chips of two different colors provided the other required materials for the game.

6. A prototype version of the game was constructed by having a graphic artist draw the game board and a typist produce the question cards to be used for the game.

7. The game was modified through the application of a game-design checklist. The modifications ensured that the rules of the game were clearly related to the instructional objective and the element of chance was adjusted to provide optimum motivation of the game.

8. The game was tried out with representative teachers and suitable modifications were made on the basis of their feedback. These modifications were designed to improve the instructional and motivational effectiveness

of the game.

The successful application of the game-development procedure verified its feasibility. Although some minor changes were made, the procedure as a whole withstood this application test. The process also provided us with authentic examples of a training game in various stages of its development. Evaluation of the game was continued to validate the procedure. A summary of these evaluative studies are provided elsewhere (Semmel and Thiagarajan, 1974). Some of the highlights of this summary are given below.

Study 1

This pilot study was undertaken by Semmel and Sivasailam (1971) for the evaluation of the ANTICIPATION game. The object of the study was to investigate the effects of repeated playing of the game.

Subject. A single, foreign born, 20-year-old female subject was used in this study. The subject did not have any previous knowledge of, or experience in, the education of handicapped children.

Materials. ANTICIPATION is a two-person anticipation game which uses a 4X3 grid. Moves in the game involve anticipating the percentage of three different types of children (normal, 66-80 IQ group, and 50-65 IQ group) at three different age levels (9, 11, and 13) who responded to questions from four different subject-matter areas (arithmetic, language, reading, and work-study). The scoring system of the game discourages players from concentrating on specific subject-matter areas or on a specific type of child. More than 150 questions are used in the game to prevent any practice effect. Normative data on these questions came from a study which surveyed 1,405 children.

Procedure. The experimental subject played a total of 20 games, each with a different opponent, over a period of three weeks. Anticipations during each round of the game were recorded on response sheets which provided a cumulative record for later analysis. At the end of each game, the subject was debriefed and asked to list any new rules of strategy she discovered during the play of the game.

Results. Each anticipated percentage was compared to the actual percentage from the norms and a deviation score was computed. These deviation scores became smaller as a funtion of the number of rounds of the game played, indicating increased accuracy in anticipation. The results revealed that the rate of learning to anticipate was most rapid for the highest (normal) and the lowest (50-65 IQ) groups respectively. The rate of learning to anticipation for the intermediate (66-80 IQ) group was the slowest. There was also a positive relationship between the rate of learning and the age of pupils for whom predictions were made.

Of the 84 strategy statements listed by the subject during the debriefing sessions, 27 dealt with game moves (e.g., "Begin with a corner cell and work toward the center."). Among the remaining were developmental generalizations (e.g., "There is very little difference between 11 and 13-year-old normal children in their responses to these language questions."), principles relating to IQ levels and performance (e.g., "Retarded children are harder to predict. They are less stable."), insights into subject-matter areas (e.g., "Arithmetic problems which involve fractions are the toughest for all children."), and test characteristics (e.g., "If a child does not know the answer he is more likely to choose the first or last alternative than any of the middle ones."). Many of these principles discovered by the subject are comparable to those found in introductory textbooks on methods of teaching retarded children.

Study II

Having informally established that the player does learn to make more accurate predictions as a result of playing ANTICIPATION, another pilot study (Zimmerman, 1973) was undertaken to investigate if this skill transfers to the anticipation of student behavior in the teacher-player's classroom.

Subjects. Nine intern teachers from the University of Louisville were involved in this study. They were randomly assigned to experimental (n=5) and control (n=4) groups.

Materials. The ANTICIPATION game was again used in this study. In addition, a 24-item test which contained questions similar to the ones used in the game was also constructed. The questions were from the areas of vocabulary, spelling, and arithmetic. The test was available in two different forms: One was for direct administration to retarded children and the other was a questionnaire for teachers' predictions.

Procedure. Five interns played TRUE GRID while the other four played an unrelated game in separate classrooms for a period of two hours. The groups were brought back together and given the 24-item questionnaire which required them to predict the percentages of children in their classrooms who would correctly answer each question. Each subject took back with him copies of the test which contained the same 24 questions and administered it to the children in his classroom using a standardized procedure. Children's responses were returned directly to the investigator for analysis.

Results. Three 2X3 (treatments x content areas) analyses of variance were performed on actual student performance (A), teacher predictions (B), and accuracy of anticipation (A - B). There were no significant differences in actual student performances. Teacher predictions of arithmetic scores differed significantly ($p < .05$) between control and experimental groups. There was a significant difference in the accuracy of anticipation in only one of the three subject-matter areas. The results indicate that, while there was a trend toward transfer of anticipation skills from the game to the behavior of children in the teacher's own classroom, the trend was not conclusive.

Study III

The lack of more impressive transfer in the previous study could have been partly due to the normative data base of the game differing from that of local students. Baum (1973) created a normative data base from local students in order to study the learning and transfer from a game incorporating that data. In the most comprehensive study of anticipation games undertaken to date, he also attempted to cross-validate the findings from earlier pilot studies.

Phase I: Collecting a Normative Data Base

Subjects. Two hundred and ninety students in special classes for the educable mentally retarded (EMR) in five junion high and three senior high public schools in Cincinnati, Ohio were used as subjects. One hundred and sixty-six of the sample were male and 124, female. Their ages ranged between 13 and 19, their IQ's, between 50 and 80.

Materials. A 70-item multiple-choice test based on the Persisting Life Problem areas identified in the Cincinnati curriculum guide for the EMR was developed by the investigator.

Procedure. The test was administered to students in classrooms in the absence of their teachers. The students were told that none of their teachers would see their answers and that their performance would not affect their grades. The investigator presented each question orally and repeated it if requested by any student. Demographic data were obtained from school records.

Results. Students were sorted into four groups according to age levels (younger -- 13-15 ; older -- 16-19) and IQ levels (lower -- 50-64; higher -- 65-80). Test results were analyzed and a frequency distribution in percentages was obtained for responses by each of the four groups of students.

Phase II: Treatment and Assessment of Anticipation Skills

Subjects. Thirty teachers (whose students had been involved in Phase I) were subjects in this phase. Eighteen teachers were male and 12, female. All had training and experience in teaching EMR children. The teachers were randomly assigned, within their schools, to either an experimental or a control condition.

Materials. The normative data collected in Phase I was incorporated into a two-person anticipation game called BATTLE CHIPS. This game required players to predict percentages for each of the four alternatives for each multiple-choice question. These predictions were recorded in specially designed response sheets for later analysis.

Procedure. Teachers were given a questionnaire for obtaining demographic data. The experimental subjects played BATTLE CHIPS while the control subjects played a two-person commercial game called PERCEPTION. During the first session subjects played games from 25 to 45 minutes, depending upon the free time available. Question cards used in this session were removed before the next one began. This session terminated when each player completed 30 rounds of the game.

Results. A deviation score for each anticipation given by the experimental players was calculated by subtracting the predicted percentages from the actual values. The types of analyses and the results are summarized in Table 4.5.

Phase III: Transfer of Anticipation Skills

Subjects. Same as those in the previous phase.

Materials. A 20-item criterion test was developed from the earlier 70-item test on the basis of a factor analysis which identified the five factors of (a) map reading and arithmetic, (b) practical-functional, (c) spelling, (d) synonyms, and (e) number usage. Items which had rotated factor loadings over .40 and which represented several areas of the curriculum were included in this criterion test.

Procedure. The names of five high-IQ level and five low-IQ level children were selected randomly from the total homeroom class lists of each teacher. These names were randomly listed at the top of the criterion test. Each teacher was required to predict which multiple-choice alternative each of these children would choose for each test item.

Results. Predictions were scored as correct if the teacher selected the same alternative the particular student had chosen earlier. A comparison of accuracy of anticipation between experimental and control subjects was accomplished through a one-way analysis of variance which did not yield any significant difference. A number of other hypotheses were also tested and the results of some of these are summarized in Table 4.6.

VALIDATION OF THE PROCEDURE FOR DEVELOPING AUDIOVISUAL TRAINING MODULES

The procedure for developing audiovisual training modules was validated through its application to the actual development of ten training modules in the TIPS FOR TEACHERS project. The project enabled us to systematically

Variables	Analysis	Result
Effect of playing BATTLE CHIPS on accuracy of anticipation	Serial analysis of variance (7 dyads x 3 sets of ten rounds of the game)	Accuracy increased significantly ($p < .05$) as a function of number of rounds played.
Relationship between teacher characteristics (age, sex, type of class taught, educational level, teaching experience, and impressions of the game) and accuracy of anticipation	Correlational analyses	No significant relationships.
Relationship between teacher characteristics and overestimates in anticipation	Correlational analyses	No significant relationships.
Relationship between student characteristics (age and IQ level) and accuracy of anticipation	Analysis of variance	No significant effects.

Table 4.5 Effects of playing BATTLE CHIPS

Variables	Analysis	Result
Relationship between students' IQ levels and accuracy of anticipation	2 x 2 Analysis of variance	Significant ($p < .01$). Performance of high-IQ EMR's were more accurately anticipated.
Relationship between factor analytic component of questions and accuracy of anticipation.	2 x 5 Analysis of variance and planned comparison	Significant ($p < .05$).
Relationship between teachers' assessment of the general ability levels of children and accuracy of anticipation	Correlational analysis	Significant ($p < .01$) positive correlation.

Table 4.6 Transfer Effects of playing BATTLE CHIPS

try out and modify the procedures from the first project. Case histories and effectiveness data on the audiovisual training modules are available from a number of CITH reports (e.g., Windell, 1975, Williams, 1976, Stolovitch, 1976,and Braffet, 1976). A short summary of one of these studies (Stolovitch, 1976) is given below to indicate the validity of the recommended procedure.

Pre-developmental Validation of the Procedure for Developing Audiovisual Training Modules

Two audiovisual training modules on the topics of instructional games for handicapped children and tutoring by parents were developed according to a systematic procedure which was to be presented later in the corresponding module from the first project. Each module consisted of a set of slides and an audiotape to provide the instructional content and a coordinated response booklet for notetaking by the trainees.

Developmental Procedure. The specific procedure in the production of the modules involved the following 10 steps:

1. A suitable topic for training teachers was identified on the basis of a needs analysis. This topic was subjected to a task analysis to identify the necessary and sufficient competencies associated with it.

2. A set of training objectives were derived from the task analysis. These objectives were edited carefully.

3. A criterion-referenced test item was prepared to measure the attainment of each training objective.

4. The criterion-referenced test items were carefully checked for their validity. The revised items were arranged in an appropriate order to provide an outline for the module.

5. A response booklet was prepared to include all the criterion items. In addition, reference materials used by the trainee (e.g., checklists and flowcharts) were included in the response booklet.

6. The script for the audiotape was written to help the trainee attain each criterion item in succession.

7. A storyboard was prepared to specify the visuals to accompany the script. These visuals were classified into different categories.

8. The audiotape for the training module was recorded.

9. A set of slides for the training module were shot and processed.

10. All three components of the training module (audiotape, slides, and response booklet) were assembled into an integrated package, ready for evaluation.

After a series of formative evaluations and revisions, the two training modules were validated through a controlled field test.

Population. Subjects for this study were teacher-trainees from Georgia and North Carolina. All 90 subjects in this study were involved in the teaching of handicapped children. Their ages ranged from 19-40+ years, with the majority in the 19-21 category. Forty of the students were at the senior level, with the others in the junior and master's levels.

Measures. A criterion-referenced test based on the objectives of both modules were prepared. This test required the trainees to plan for a parent-tutoring program and to adapt an instructional game for handicapped learners. Separate attitude scales to measure the trainee's attitudes toward parent-tutoring and toward the instructional game for the handicapped were also prepared.

Procedure. A modified form of posttest-only-control-group design was used for the evaluation of the two audiovisual training modules. As Figure

4.3 indicates, the design involved the random assignment of subjects and modules to two different groups. Upon completion of the modules the common criterion-referenced test was administered to both groups. After a three-week delay, groups were assigned to the other module and the same testing procedure was followed. Attitude scales towards the content of the two modules were also administered.

Results. A two-factor repeated-measures analysis of variance (Table 4.7) on criterion-test results established that the trainees who went through an assigned module scored significantly higher than those who did not. The same analysis of variance revealed no effect of pretesting on the trainees' posttest performance. A significant decrease between the immediate and the delayed posttest was observed. A series of multiple regression analyses revealed that teaching experience, level of education, age, and the number of special education courses taken had no significant effect on criterion-test scores. Attitude toward parent-tutoring was found to be significantly higher for groups which went through the parent-tutoring module than for the group which did not (Figure 4.4). This type of result was not obtained in the case of the module on instructional games, although a similar trend was noted (Figure 4.5).

The results establish the feasibility of applying the recommended procedure to the production of audiovisual training modules. The modules developed in the study produced demonstrable cognitive and affective gains.

SUMMARY

This chapter discussed the process and results of pre-development validation in the project. The object of such validation was to ensure that the competencies taught to the teacher trainers-are both practical

	Trial I	Trial II
Group A (n=45)R	S_1 X_1P AO_1 AO_2 AL_1 AL_2	X_2G AO_3 AO_4 AL_3 AL_4 S_2
Group B (n=45)R	S_1 X_1G BO_1 BO_2 BL_1 BL_2	X_2P BO_3 BO_4 BL_3 BL_4 S_2

KEY:

R = Random assignment of subjects.

Groups:
A = Subjects who worked through the parent-tutoring module during Trial I.
B = Subjects who worked through the instructional games module during Trial I.

Semantic differential on self-instructional format:
S1 = Pretest
S2 = Posttest

Instructional treatments:
X1P = Parent-tutoring module during Trial I.
S1G = Instructional games module during Trial I.
X2P = Parent-tutoring module during Trial II.
X2G [illegible] Instructional games module during Trial II.

Criterion-referenced tests:
A01 = Test on parent-tutoring (after parent-tutoring module -- Trial I).
A02 = Test on instructional games (after parent-tutoring module -- Trial I).
A03 = Test on parent-tutoring (after instructional games module -- Trial II).
A04 = Test on instructional games (after instructional games module -- Trial II).

B01 = Test on parent-tutoring (after instructional games module -- Trial I).
B02 = Test on instructional games (after instructional games module -- Trial I).
B03 = Test on parent-tutoring (after parent-tutoring module -- Trial II).
B04 = Test on instructional games (after parent-tutoring module -- Trial II).

Attitude scales:
AL1 = Scale on parent-tutoring (after parent-tutoring module -- Trial I).
AL2 - Scale on instructional games (after parent-tutoring module -- Trial I).
AL3 = Scale on parent-tutoring (after instructional games module -- Trial II).
AL4 - Scale on instructional games (after instructional games module -- Trial II).

BL1 = Scale on parent-tutoring (after instructional games module -- Trial I).
BL2 = Scale on instructional games (after instructional games module -- Trial I).
BL3 = Scale on parent-tutoring (after parent-tutoring module -- Trial II).
BL4 = Scale on instructional games (after parent-tutoring module -- Trial II).

Figure 4.3 Summary of Treatment and Testing Procedures

Table 4.7a

Two-Factor Repeated-Measures Analysis of Variance of Scores on the Criterion-Referenced Test on Parent Tutoring

Source	df	MS	F
Groups	1	3362.69	29.20*
Test Administration	1	2205.00	59.03*
Subjects (Groups)	88	115.18	
Group x Test Administration	1	5802.69	155.34*
Subjects x Test Administration (Groups)	88	37.36	

* $p < .01$

Table 4.7b

Two-Factor Repeated-Measures Analysis of Variance of Scores on the Criterion-Referenced Test on Instructional Games

Source	df	MS	F
Groups	1	590.42	25.09*
Test Administration	1	314.69	18.44*
Subjects (Groups)	88	23.53	
Group x Test Administration	1	2376.20	139.21*
Subjects x Test Administration	88	17.07	

*$p < .01$

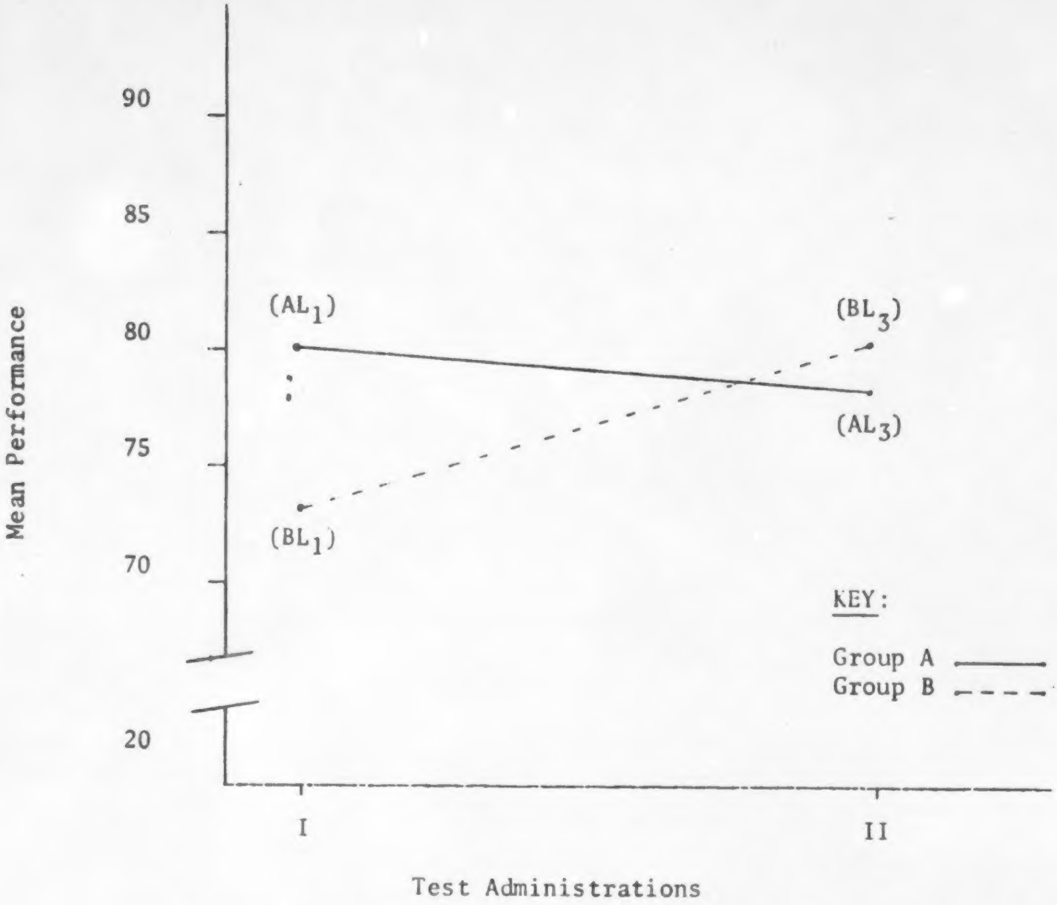


Figure 4.4 Mean Attitude Scores of Groups Toward Parent-Tutoring

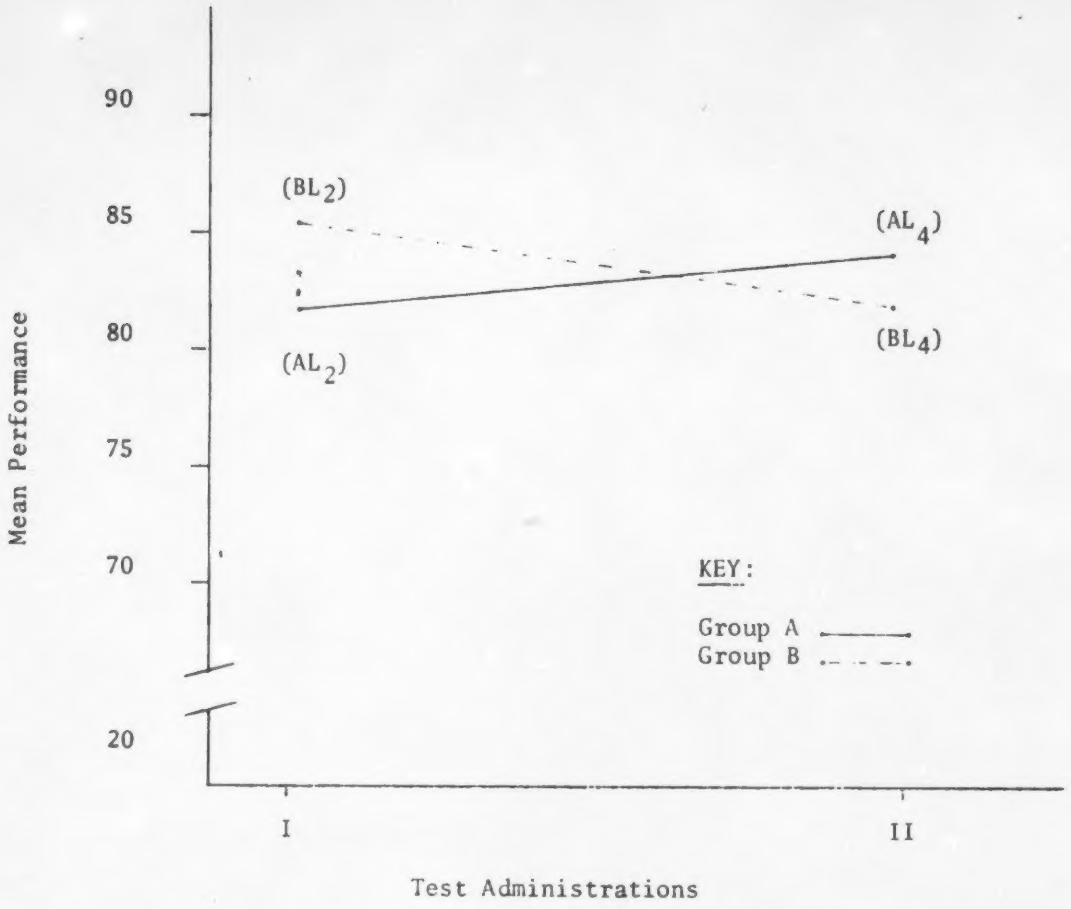


Figure 4.5 Mean Attitude Scores of Groups Toward Instructional Games

(i.e., usable within the constraints of a typical teacher-training program in special education) and valid (i.e., likely to result in effective training materials). Such pre-development validation was facilitated by the fact that the Center had undertaken three other projects which enabled us to try out the recommended procedures and to refine them under actual field conditions. The procedures for the three training formats (structured roleplay materials, training games, and audiovisual training modules) were found applicable to actual projects without major problems and their application resulted in concrete products. Further evaluation of these products indicated that they were not only usable with teacher-trainees but also capable of producing measurable instructional effectiveness. This pre-development validation also provided indirect support for the other proposed modules (trainee analysis, task analysis, and concept analysis) since the relevant procedures were involved in the production of training materials in all three formats.

CHAPTER 5. MEDIA SELECTION AND DESIGN OF THE MODULES

The project team worked on other stages of the instructional-development process while the competencies were being validated through the procedures outlined in the previous chapter. In this chapter, brief summaries of trainee and context analysis and media and format selection are provided. Highlights in the design of different modules are also recounted.

Trainee Analysis

Teacher-trainers in special education are the target population for the proposed instructional system. In addition, the instructional system is designed to be helpful to directors of funded projects for the development of teacher-training materials in special education. To analyze the characteristics of these groups, a questionnaire was administered to randomly selected members. In addition, a number of trainers were personally interviewed during a preconvention workshop sponsored by the Teacher Education Division at the annual convention of the Council for Exceptional Children in New York in 1974. These interviews used the questionnaire as the basis for collecting information. Results of this trainee analysis are provided in a summary form below.

Subject-matter competence. Teacher-trainers have considerable theoretical knowledge about different competencies to be taught to their trainees. However, they have very little previous experience in the systematic development of training materials, although many of them have prepared their own textbooks and handouts. Most trainers are familiar with the requirements for producing scholarly texts, but very few have the competencies of developing self-contained training materials. The majority of trainers had one or more favoriate topics which they want to have converted into a training module.

Their perception of a training module was a fairly narrow one: a duplicated handout with a set of behavioral objectives with references to other instructional resources. Among major misconceptions, trainers tended to view roleplay and training games as "adjunct fun activities." Their perception of an audiovisual training module was that of a format which required far more technical competencies beyond what they were capable of acquiring.

Attitudes. Teacher-trainers were about evenly divided in their attitudes toward competency-based teacher education in special education. Half of them considered this movement as nothing more than a passing fad, while the other half perceived it to be a genuine breakthrough in teacher education. Almost all trainees agreed that there is a legitimate need for more accountable training materials, although very few thought that it was their job to develop and evaluate such materials. Many trainers complained about the lack of administrative support for such activities. They were sceptical of producing their own training materials. Among the apprehensions listed by teacher-trainers in developing training materials were the following:

a. Preparation of training materials requires a large number of people.

b. There are no academic rewards for development of training materials.

c. Systematic development of training materials takes such a large amount of time that it is beyond the capacity of individual trainers.

d. The use of media requires an entirely new set of competencies from those which trainers currently possess.

e. Formative evaluation of instructional materials never pays off because younger teacher-trainees are not serious about their profession.

The attitudes of teacher-trainers toward different training media and format indicated certain regular patterns. By and large, most trainers preferred a workshop situation, although they were convinced that no real learning takes place in such situations. As an alternative, trainers preferred some form of individualized training where they were able to make their errors in total privacy. The majority of teacher-trainers appeared to be apprehensive about any group-based learning format which required them to respond in the presence of their peers.

Language. The level of language of most teacher-trainers in special education was fairly sophisticated with respect to the technical terminology in their field. However, their familiarity with the specialized vocabulary of instructional development was fairly low. In addition, there were certain terms used in both fields (e.g., task analysis) which appeared to have slightly different connotations. Their preference was for a conversational, rather than a "textbook" style for any training module they had to work through.

Tool skills. Teacher-trainers in general had considerable expertise in learning from different types of instructional materials. However, they were most familiar with the print medium and least familiar with multimedia packages.

Context Analysis

The proposed instructional system was primarily designed for use by teacher-trainers in a self-instructional mode. A secondary delivery system involved the workshop format in which a group of trainers were to undergo a three-day production workshop. Details of these alternative delivery systems were worked out with a context-analysis questionnaire (Fig. 5.1) which was used in conjunction with the earlier one on trainee analysis. Major findings of the context analysis are summarized below.

Target trainees. The primary audience for the proposed instructional system were teacher-trainers in special education. More specifically, the

1. Who constitutes the primary and secondary target populations?

2. Is the instructional system to be used with an instructor? If so, what is his/her role?

3. What major delivery systems are planned for?

4. What support facilities and media equipment are available for the use of the training materials?

5. What are the cost constraints for the proposed system?

6. What are the scheduling constraints for the proposed system?

Fig. 5.1 Questionnaire used for Analyzing the Context in which the Proposed Training System is to be used.

project concentrated on these teacher-trainers who were working in a competency-based program. There were also a few other secondary audiences for the proposed instructional system:

a. teacher-trainers in regular education (especially those involved in training elementary school teachers in mainstreamed situations)

b. administrators of teacher education programs

c. personnel working on funded instructional-development projects in teacher training, and

d. commercial producers of teacher-training materials.

Instructor. It is unlikely that a knowledgeable instructor is available for providing instructional inputs to the system. No instructor was assumed to be present in the self-instructional setting in which the proposed instructional system was to be utilized. In the workshop situation, there would be a director, but his/her role would be primarily that of a manager rather than that of an instructor. Hence, the proposed instructional system should be instructionally self-contained and capable of functioning without the need for an instructor.

Delivery systems. The training materials were to be used essentially in an independent learning situation. A variation of this delivery system was to encourage faculty members to work collaboratively in small groups in order to produce teacher-training materials of common interest. There was also a plan to offer workshops based on the instructional system on a regional basis.

Utilization facilities. The training materials would probably be housed in learning resource centers in schools of education. Most of these facilities have audiocassette recorders, slide/filmstrip projectors, and synchronized tape-filmstrip viewers. It was also proposed that the materials be taken home by the teacher-trainers.

Cost constraints. It was thought unlikely that the materials would be sold directly to teacher-trainers. However, they might be expected to invest a nominal sum (less than $2) toward the purchase of any printed component.

The total package was likely to be bought by teacher-training programs under external funding or through the use of media/library allocations. Comparable cost for previously purchased instructional packages ranged from $200 to $350.

Scheduling constraints. Trainees seemed to prefer short modules of less than 60 minutes duration with equivalent time requirements for follow-up activities. They did not appear to have released time for implementing any skills they might have acquired. In a workshop situation, trainees preferred one-day activities but could frequently attend sessions which lasted up to a week.

Specifications and Constraints for the Instructional System

On the basis of these analyses, the following specifications were drawn up for the instructional system:

1. Assume minimal competencies on the part of teacher-trainers in skills and knowledge related to instructional design and development.

2. Use a professional but conversational language, with special care to define and illustrate all technical terminology which deal with instructional design and development.

3. Provide ample opportunities to teacher-trainers for the application of the skills and knowledge to self-selected teacher-training competencies.

4. In the examples, use a wide variety of teachers and trainers from various ethnic backgrounds who deal with different categories of handicapping conditions.

5. The instructional system should be divided into a number of self-contained modules.

6. The modules should be independent of any instructor.

7. The module should permit flexible use with individuals and small groups.

8. Equipment required for use of the module should be available in a portable form for use at home.

9. Mediated materials for the modules should be compatible with commonly available media equipment in teacher-training programs.

10. The cost of the total instructional system should not exceed $300; the cost of any individual-use component should not exceed $2.

11. Actual viewing time for the module should be less than 30 minutes. No complex procedure involving major cost outlays or a large number of professional staff should be included among the competencies taught in the modules.

Media Selection

On the basis of these and earlier analysis, it was decided to use a multimedia format for the instructional system. Basically, three different media were to be involved in the presentation of the instructional message for each module:

1. Response booklet. This was the primary component of each module and took the form of a workbook. The booklet contained the objectives of the module, criterion-test items to match each objective, ample space for responses by the teacher-trainer, and a set of review materials and references for later use. Each teacher-trainer received his/her own copy of this booklet and used it to take notes and make responses during the audiovisual presentation. After completing the booklet, the trainer kept it as a permanent and personal record.

2. Audiotape. This component of each module coordinated the teacher-trainers interaction with the instructional material. The audiotape assumed the major instructional load and tutored the trainer through the skills and knowledge to be mastered. The tape provided most of the directions, examples, explanations and exercises. In general, the tape lead the trainer from one

subtask to the next in an efficient and motivating manner until the entire competency was acquired.

3. Filmstrip. Accompanying the audiotape was a set of visuals in a filmstrip format. These visuals enhanced, enriched and explained the message on the audiotape. For example, the filmstrip provided photographs of classroom scenes to add realism to the task. It also used captions, figures, diagrams, and flowcharts to provide a visual presentation of various concepts and procedures.

Design

As indicated earlier, the total instructional system in this project consisted of seven training modules. All modules were presented in the audiovisual training format with the three components of response booklet, audiotape, and filmstrip. The design of each module is briefly described below:

Design of the Response Booklet

The response booklet for each module consisted of the following five major items:

1. Objectives of the module.
2. Examples of different concepts.
3. Criterion-referenced exercises based on each objective.
4. Adequate structured space for the teacher-trainer to complete each exercise and thus create a permanent record for future reference.
5. Checklists and references for future use.

An example set of instructional objectives from the response booklet for Module 4 – How to Analyze Teacher-Training Concepts– is given as Figure 5.2. The next two figures (5.3 and 5.4) illustrate the type of examples and exercises contained in the response booklet which are directly related to the first of these instructional objectives. Figure 5.5 shows a typical checklist found in the

OBJECTIVES

Upon the completion of this module, you will be able to analyze a teacher-training concept and generate suitable sets of examples and nonexamples for teaching and testing. Specifically, you will be able to demonstrate the following competencies:

1. ANALYZE a teacher-training concept and IDENTIFY its critical and variable attributes.
2. GENERATE a set of divergent examples, using the list of variable attributes of the concept.
3. GENERATE a set of close-in nonexamples, using the list of the critical attributes of the concept.
4. ARRANGE the examples of a concept in order of decreasing saliency.
5. MATCH each nonexample of a concept with a suitable example.

Fig. 5.2 Sample set of Instructional Objectives from the Response Booklet for Module 4: How to Analyze Teacher-Training Concepts.

An Example of Critical and Variable Attributes

CONCEPT: Physical Aggression

Critical Attributes:

1. It involves a physical behavior.
2. Is is aggressive.
3. It is a behavior of a student.
4. It is directed against another person.

Variable Attributes:

1. Form of aggression. It may take any form of hitting, kicking, pushing, etc. It does not require actual physical contact, as in the case of throwing something at somebody.

2. Target of aggression. The "victim" may be another student, teacher, or anyone else.

3. Provocation. The aggressive act may be self-initiated or provoked by someone else.

4. Verbal accompaniment. The aggressive act may or may not be accompanied by verbal abuse.

Fig. 5.3 A Sample Set of Examples from Module 4, dealing with the first objective listed on Figure 5.2.

Exercise 1

Concept Analysis

Select a teacher-training concept from your area of speciality.

Apply the procedure demonstrated in this module to the analysis of your concept.

Upon the completion of your analysis, you should have a list of critical and variable attributes of the concept as shown in the examples on pages 2, 3, 4 and 5.

CRITICAL ATTRIBUTES	VARIABLE ATTRIBUTES

Fig. 5.4 An Example of a Criterion Exercise from Module 4. This exercise is based on the first instructional objective listed on Figure 5.3.

CHECKLIST FOR TRAINING GAMES

1. Make sure that the rules of the game are clearly related to its instructional objectives.

2. Control the element of chance. If the game depends entirely upon chance, there is not much scope for learning. On the other hand, if the game depends upon skill and knowledge only, it becomes a test situation.

3. Use rules of play fair. Do not give undue advantage to any player. Permit fair competition between players of varying abilities.

4. Keep players involved. During each round of the game, require all players to participate. Avoid penalty rules which eliminate a player from the game.

5. Keep each round of the game as brief as possible so that the game may be played repeatedly.

6. Simplify the rules of the game as much as possible. Avoid irrelevant embellishments.

Fig. 5.5 A Sample Checklist from the Response Booklet for Module 6: How to Develop Teacher-Training Games.

response booklet for Module 6: How to Develop Teacher-Training Games.

Scripting

The script for the audiotape for each module generally followed a similar format. The teacher-trainer was introduced to a problem in competency-based teacher education. Through narration and dialogue, the trainer vicariously shared the process of solving the problem through the design and development of training material. The script lead the trainer toward each criterion exercise and required him/her to respond to these exercises after turning off the tape. Upon completion of each exercise, the trainer turned the tape back on and received feedback to check the adequacy of the response. This process was repeated until the trainee had completed all criterion exercises.

Visual Design

Even as each script was being written, the instructional developer noted down ideas for the visual component on the filmstrip. Upon completion of each script, the writer and a photographer worked out details of presenting visuals on the filmstrip so that they harmoniously reinforced the instructional message on the audiotape. These ideas were then translated into slide form. In general, the modules required the following four types of visuals:

1. Captions. Key terms and labels which were shown on screen so as to reinforce the discussion of the underlying concepts.

2. Graphics. Diagrams and flowcharts which explained complex procedures and concepts. These were first drawn by our graphics department and later photographed.

3. Propshots. Photographs of equipment and materials (e.g., a slide projector) to enhance the discussion of various facets of instructional design and development.

4. Live shots. Photographs of people working through various aspects of developing teacher-training materials. Such live shots were employed to add realism to the module.

5. Production and assembly. Various members of the project team produced each component of the module. An instructional developer coordinated these activiteis and ensured quality control. When all components became available, the prototype version of each module was assembled.

SUMMARY

This chapter outlined the analysis of the characteristics of the target population for the instructional system and the context in which it is to be used. Based on these analyses, specifications and contraints for the system were prescribed. The combination of print, audiotape, and filmstrip was chosen to be the media format for the instructional system. A total of seven modules were systematically designed and developed in this format in order to help teacher-trainers acquire the competencies of developing their own training materials.

CHAPTER 6. EVALUATION OF THE INSTRUCTIONAL SYSTEM

An integral aspect of the instructional development process is that of formative evaluation. Each of the seven modules underwent a number of expert appraisal and trainee-testing activities to increase their instructional and motivational effectiveness. Some of the major features of this evaluation-revision activity are briefly reported below.

Expert Appraisal and Modification

A pool of resident experts were assembled to maintain quality control over the development of the modules. This panel included special educators to check the accuracy and adequacy of the content and the authenticity of the examples, instructional developers to evaluate the steps and sequence of instruction, media specialists to check the technical quality of production, and teacher-trainers to test the usability and feasibility of the package.

As soon as each of the seven modules were available in their prototype form, they underwent an internal review by the developmental team and the panel of experts. Using checklists which focused on the salient characteristics of the target population, the team evaluated, analyzed and revised the material on the basis of a self-editing procedure. In addition, the experts provided feedback on the accuracy, adequacy, and appropriateness of each module. Each expert was asked to focus on his/her specialized area and to comment upon those components of the modules which were relevant to him/her. To further focus the activities of the expert, each person used an appropriate checklist to identify specific sources of errors and inefficiency from his/her point of view. The developmental team used the expert feedback to make appropriate revisions.

Individual trainer testing and revision

Instrument Construction. This activity began with the identification of relevant evaluative aspects of the modules and the learners. These included such input variables as the characteristics of the teacher-trainers, process variables as the time required to work through each module, and output varibles as changes in attitudes, skills, and knowledge. These variables were operationalized through the construction of suitable tests, scales, and other instruments.

Individual teacher-trainers and teaching assistants at Indiana University were involved in preliminary developmental testing and revision of the modules. The evaluator from the team tried out each module on one or two trainers. Intensive observation data were collected both during and after the tryout sessions on the reactions, remarks, and responses of the learners. The trainer was also probed during and after the session for reasons for his/her errors and learning difficulties. Revisions were made at the end of each tryout session to improve the instructional quality of the material.

FIELD TEST OF THE MODULES

After each individual module underwent extensive modifications on the basis of individual tryouts, a final field test of the entire package was undertaken. This testing was done in a self-contained workshop situation structured to replicate the field conditions as much as possible.

Subjects. A total of 14 teacher-trainers in special education were involved in this field test. These persons were randomly selected from a number of teacher-training programs in special education, primarily from the midwest region. There were three instructors and one curriculum specialist in the group; the others were all assistant professors. All trainers taught one or more courses on special education methods.

Instruments. To prevent any reactivity, no paper and pencil tests were given to the trainers participating in the field-test workshop. Instead, actual products from each trainer were retrieved in order to test their mastery of the objectives for the various training modules. In this process, both intermediate products (e.g., task analysis, concept analysis, specific behavioral objectives and criterion-test items) and final products (e.g., structured roleplay, teacher-training games, or training modules) were analyzed to provide data on the effectiveness of the training modules.

Procedure. The teacher-trainers were informed that the workshop was to be considered just like any other inservice workshop they attended, except for the retrieval of all their products. The first module--materials--was shown to the entire group. Each participant was provided with an individual copy of the response booklet for taking notes during the presentation. After viewing the module, participants in the field-test workshop were asked to work in pairs to identify a teacher-training topic and an instructional format (structured roleplay, teacher-training game, or audiovisual training module). Minor adjustments were made in their choices so as to avoid duplication of the topics and to ensure that approximately equal numbers of trainers worked on each of the three different instructional formats.

Participants were required to apply the skills from each of the next three modules to the topic and format they selected. The modules and the criterion-referenced exercise they undertook are listed in Table 6.1.

Table 6.1

Criterion-Referenced Exercises

Training Module		Criterion-Referenced Test Activity
How to Analyze your Trainee	1.	Define the target population for your training material.
	2.	Identify those characteristics of the target population which are likely to interact with the design of the training materials.
How to Analyze Teacher-Training Tasks	1.	Analyze the teaching competencies related to the topic you have chosen.
	2.	Arrange your task analysis into a hierarchical set of necessary and sifficient subtasks.
	3.	Derive specific behavioral objectives from your task analysis.
How to Analyze Teacher-Training Concepts	1.	Analyze the teaching concepts that are related to the topic you have chosen.
	2.	List the critical and variable attributes of the concept.
	3.	Create a set of examples and non-examples to teach the concept.

Participants in the field-test workshop were permitted to work in pairs and to consult with the other teacher-trainers in completing these exercises. Both of these conditions were considered to be desirable and similar to what is obtainable in various teacher-training programs. They were recommended to the participants as suitable procedures for increasing the objectivity and efficiency of their own training material preparation.

After the completion of these preliminary analyses, the teacher-trainers were required to develop instructional materials using the format they had selected. Each pair of participants were required to work through only one of the remaining three modules since they were to produce a joint instructional material in a single format. The participants worked on the broad outlines of their productions during the three-day workshop. They were asked to complete the remaining production and evaluation tasks in their own individual institutions.

RESULTS

Intrinsic evaluation

Each participant completed the first three assignments on learner, task, and concept analyses during the first two days of the field-test workshop. Participants' products were evaluated by two independent instructional developers at CITH, with the help of an itemized checklist which used a five-point scale for each item. Data on these checklist evaluations are given in Table 6.2. These data indicate that all participants were able to achieve highly successful transfer of their analysis competencies. Although their application of concept analysis was generally lower than their applications of learner and task analyses, all products were acceptable with only minor modifications added by professional instructional developers.

Extrinsic evaluation

Participants were asked to complete the design, development, and evaluation of their teacher-training materials at their own institution and to keep a log of their activities. They were also asked to turn in their materials, an edited version of their logs, and any evaluative data whenever they felt that they had completed the task. There was very minimal interference or encouragement in their projects in order to ensure maximum replicability of the findings to other field conditions.

At the end of a three-month period, we obtained "final" reports from eight of the fourteen participants. We conducted follow-up interviews with the other six participants by telephone. Three of them indicated that they had decided to drop their projects, and the other three required more time for completion. A series of questions were asked of those who "dropped

TABLE 6.2 Intrinsic evaluation from the field-test workshop

Participant	Ratings on analysis assignments		
	Learner analysis	Task analysis	Concept analysis
1	4	5	3
2	5	5	4
3	5	4	4
4	5	5	5
5	5	5	4
6	4	4	3
7	5	5	3
8	5	4	4
9	4	4	4
10	3	4	4
11	5	5	5
12	5	5	4
13	4	4	4
14	5	5	5
Mean	4.57	4.57	4

out" of the project in order to discover their reasons for quitting. An analysis of the products and interview data leads to the following conclusions about the utility of the instructional system:

1. Participants who completed the project reported no major problems in applying the instructional development skills to the preparation of a competency-based teacher-training material in a format of their own choice.

2. An in-depth evaluation of the products indicated a high degree of transfer of the skills taught in the field-test modules. All participants had successfully achieved a desired level of congruence between the analytic activities and the design of the material.

3. All except one participant were able to use the training materials immediately in an ongoing course.

4. The development of audiovisual training modules consumed much more time and resources than the other two formats. However, two of the people who chose to work in these formats were the first ones to complete their projects.

5. The number of courses taught by the participants seem to be negatively correlated with the speed of completion of the instructional material. There is an obvious need for released time if teacher-trainers are to engage in instructional-development activities.

6. Nonfinishers listed work pressure, lack of administrative support, committee work, and lack of coordination with the co-developer in another training institution as the leading causes of delay in their projects. None of them reported lack of skill or knowledge to be a major factor.

7. Dropouts listed the same causes for their decision not to continue with the project. In addition, one person changed his job and another discontinued teaching the course into which her instructional material was to have been incorporated.

8. Those who completed the project, as well as those who needed more time to complete it, indicated their plans to continue utilizing (and producing more) materials.

Four sample reports on participant-developed mateirals are attached to this report as appendixes A-D.

SUMMARY

Systematic formative evaluation was incorporated in the developmental process for the production of the instructional system. The modules were repeatedly revised on the basis of expert comments and trainee feedback. The "final" summative field-test of the system was conducted in the form of a typical inservice workshop. The design of the workshop and the follow-up activities reflected conditions which were likely to be obtained under conventional teacher-training contexts in special education. Intrinsic evaluation of participant products at intermediate stages of development indicated a high degree of transfer of analysis skills. Follow-up evaluation of participant-developed materials and their records indicated that the design, development and evaluation skills also show a high degree of transfer. Interviews with nonfinishers and dropouts indicated that the causes for their delay or discontinuation reflected environmental obstacles rather than skill/knowledge deficiencies.

APPENDIX A

REPORT ON A STRUCTURED ROLEPLAY MATERIAL DEVELOPED BY A PARTICIPANT IN THE FIELD-TEST WORKSHOP

UP A TREE: A SIMULATED HANDICAP INSTRUCTIONAL EXPERIENCE

A Report by R. Bruce Baum

Rationale

The rationale for this project can be viewed from several aspects: a) the need to educate professionals so that they are able to provide quality education and life experiences for handicapped individuals, b) principles of learning, and c) cost effectiveness. It is now a generally accepted premise that handicapped persons should be provided all the rights that nonhandicapped individuals enjoy, yet it is also recognized that this premise is not yet realized. Court cases concerning such issues as more humane treatment of individuals in institutions, access to public buildings by physically handicapped persons and more appropriate means of psychological testing of minority group children have recently come within the public purview. It was not until 1972 that it was established in one state that moderately and severely mentally retarded children (generally those with IQ's between 25 and 50) had the right to a free public program of education and training (Nancy Bowman and the Pennsylvania Association for Retarded Children versus the Commonwealth of Pennsylvania, 1972).

The above conditions indicate a need to provide appropriate education for handicapped individuals. Understanding of handicapped persons can be viewed as a prerequisite to their instruction and training and one way of providing such understanding is through simulation activities that allow one to experience the problems of these people.

There is presently a trend toward eliminating the labeling and categorization of mildly handicapped children. Whereas, previously, many mildly handicapped pupils have been isolated in special classes or special schools, there is now a trend toward viewing these children not as handicapped children, but rather as children who have special needs. This perspective, in turn, has led to attempts at maintaining these children within regular education programs with the provision of special services where needed. In a number of cases there has also been an emphasis on returning children from special classes to regular class programs. A term applied to this process of educating children with handicaps and non-handicapped children in the same settings is that of "mainstreaming."

Thus, we may soon find most mildly handicapped children being educated by regular classroom teachers. However, it is important that regular class teachers be prepared to work with children with special needs. These teachers need understanding of exceptional children in order to allay their own fears, decrease their misconceptions and give them needed confidence as specific skills. One means of providing that needed understanding is through simulation activities which will help these teachers see that handicapped children are more similar to "normal" children than they are different. Also, it will help them empathize with the academic and social problems that the students might evidence and, in turn, lead them to develop appropriate instructional strategies which will promote cooperation and interaction among all children.

The second component of the background for this project relates to applying principles of learning. Research has demonstrated consistently that motivation is a major key to learning. No longer are most students or faculty willing to accept the traditional stereotype of the professor who lectures in a monotone for the duration of a class period with little variation throughout a semester. We now recognize the role that motivation plays in learning in the utilization of media such as audio and videotapes, films, filmstrips and overhead transparencies. There also is seen more utilization of decision-making exercises, group projects and other activities designed to increase motivation in college classrooms. One type of such activities is that of simulated experiences. Simulations have recently begun to be employed in teacher education. In fact, several empirical studies have demonstrated increased learning through simulations, especially in terms of learning in the affective or emotional domain. D. R. Cruickshank (The Use of Simulation in Teacher Education: A Developing Phenomenon. Journal of Teacher Education, 1969, 20, 23-26), in his use of simulations designed for teacher education, has demonstrated that behaviors observed in the simulated setting reflect student-teaching behaviors in public school settings; and he found that simulation did produce a change in trainees' behaviors. B. Y. Kirsh (Classroom Simulation: A New Dimension in Teacher Education, Title VII, NDEA, Project #886, 1965) showed that the use of simulated experiences prepared undergraduate students for student teaching up to three weeks earlier than a control group that experienced different instructional activities. Thus, simulation activities can be seen as a viable instructional alternative through which understanding can occur.

The third component of cost effectiveness can be realized, because once the Simulated Instructional Module is developed and packaged, it will require little expenditure for maintenance. Unlike films or videotapes, which usually have to be ordered each semester for relatively high rental fees, the module will be available to faculty on a particular campus for borrowing at no cost.

Learner Analysis

TARGET POPULATIONS:

1) Undergraduate and graduate students beginning their professional preparation in special education
2) Undergraduate and graduate students completing their professional preparation in regular education
3) Inservice regular education teachers

I. Subject-Matter Competence

A. Level of knowledge and skills: Only a very basic understanding of the nature of handicapping conditions is assumed.

B. Background experiences: Very little or none is assumed.

C. Potential major misconceptions: Many are likely. The absence of formal course work in special education may lead to the presence of many stereotypes regarding the nature and functioning of handicapped individuals.

II. Attitude

A. General attitude toward the content: It is expected to be positive on the parts of the special education majors. Others may be passively resistive to the topical area — especially if they are being coerced into working with exceptional children.

B. Instructional format and media preferences: It is assumed that the trainees will be receptive to approaches using a variety of instructional formats and media other than continuous, lengthy monotone lectures.

III. Language

A. Language level of trainees - specialized terminology: It is expected that the language functioning of the trainees is, at least, on a sixth-grade level since all have been admitted to college. Little specialized terminology can be assumed.

B. Style of language preferences: English

IV. Instructional Materials and Equipment

A. Sensory-perceptual deficiencies: Some may wear glasses.

B. Instructional materials and equipment usage: It is assumed that they can use materials and equipment with instruction.

Concept Analysis

Concept: Multiple Handicap

Critical Attributes:

1. Involves more than one handicapping condition.
2. Involves two or more handicapping conditions in one individual.
3. Individual involved is perceived as "not normal" by others.
4. Individual functions in cognitive and/or affective and/or psychomotor areas at least two years below that expected by his/her chronological age.

Variable Attributes:

1. Can range in degree of severity of one or both disabilities.
2. May be a discrepancy in functioning between the two modalities.
3. May be a range in "non-normalcy" as perceived by others.
4. Modalities may be improved artificially and/or through training.

Close-in Nonexamples:

1. Individual is an auditorily and visually impaired, severely retarded paraplegic with spinal bifida, Kyphosis, and halitosis.
2. Individual wears glasses and a hearing aid so that he/she is not perceived as abnormal.
3. Individual is visually and auditorily impaired but functions on a level commensurate with her/his chronological age.

Divergent Examples:

1. Individual is visually impaired and mentally retarded.
2. Individual wears glasses that minimize the visual disability but is profoundly mentally retarded.
3. Individual is emotionally handicapped due to auditory and visual disabilities yet is intellectually superior and superior in physical/perceptual skills.

Behavioral Objective

Participants will experience artificially imposed sensory and/or physical disabilities and will evidence their frustration and understanding of those disabilities through an inability to easily complete a basic motor task and through written and/or verbal comments regarding their feelings and perceptions following the experience.

Format and Media Justification

The format and media selected were based on the following criteria: 1) materials that would create impairments of physical and/or sensory capabilities, 2) ease of acquisition, 3) cost effectiveness (i.e., inexpensive).

Production

Originally the design of this project included a videotape that would orient the participants to the nature of the simulation game. Due to pragmatic considerations, this was not implemented. The development of an audiotape was also considered but, to date, this has not been implemented. The development of the audiotape is still under consideration. The original script for the videotape (handwritten) can be found in Appendix A. In lieu of the above, a printed orientation was utilized. This can be found in Appendix B.

The original design of the various disability simulators were as follows:

Visual Problems - small plastic bags (Baggies) folded in half with strings attached to each end so they could be placed over the eyes of the participant and tied around the person's head.

Auditory Problems - ear plugs or earphone-type noise reducers.

Fine Motor Coordination Problems - strings tied around the thumb and forefinger and the other three fingers of each hand.

Gross Motor Coordination Problems - a) a quantity of newspapers wrapped and tied around each arm of the participant;

b) rope or heavy string tied around the legs of the participant.

Speech Problems - mouthguards (such as those used by professional athletes) would be placed in some participants' mouths to simulate speech problems.

Self-Appraisal and Evaluation

The video- and audiotapes seemed to be "extras" that could be added once the basic format and structure of the simulation game was developed and refined. Therefore, they were eliminated as parts of the initial development.

In regard to the various simulations, the following rethinking occurred:

Visual Problems - The plastic bags could only simulate visual acuity problems. It was thought that goggles or safety glasses with parts blocked off could simulate more specific visual problems.

Auditory Problems - It seemed that ear plugs for all participants would be initially expensive and that they would require sterilization to be used repeatedly. Earphone-type noise reducers were found to be too expensive. It was thought that cotton balls inserted in the ears could provide a sufficient hearing impairment for the purposes of the project.

Gross Motor Coordination Problems - a) Newspapers when tried were ineffectual in immobilizing the arms of the participants. Therefore it was decided to replace those with pieces of wood or dowels that would be applied like splints.

Expert Appraisal

The developer is an expert in both Special Education and Simulation Games. Therefore, he relied primarily on his own expertise in these areas. However, he outlined the nature of his project to several colleagues and graduate students in Special Education who provided some feedback resulting in some modifications, such as some of those outlined in the previous section.

Student Testing

Field testing with four undergraduate students (Special Education majors) was especially insightful. They were given both boards and ½" dowels cut about 15" long, lengths of twine to attach the boards to the arms of our participants, lengths of twine to tie their fingers together and safety glasses to simulate various visual problems. The "teacher" was given the handout on the lesson (see Appendix B) and some assistance was given to help the participants become "handicapped". The "lesson" took about 25 minutes in which much activity and noise were generated.

Problems noted in this first field testing were:

1) The strings around their fingers did not hold well and the participants were still able to move them with relative ease.

2) Dowels did not work as arm splints--they moved, slid down and did not keep the arms inflexible.

3) It took a considerable amount of time to tie the fingers together and to tie on the "splints".

Based on these findings, the following revisions were made:

1) Masking tape (first 1 inch and then 1½ inch) was used to keep the fingers immobile.

2) Dowels were eliminated and lengths of wood (1½ inch x ¼ inch x 15 inches) were acquired to serve as splints.

Semifinal Evaluation

Up A Tree has been field-tested on three occasions:

March 1, 1976 - With 18 houseparents and counselors working in group homes with moderately mentally retarded residents.

Feedback - Following the workshop, the participants were asked to respond to the following: 1) What did you learn from this experience - How did you feel? What insights did you gain? 2) How could the simulation game be improved to make it more effective?

There was a range of comments, but the predominant theme was that the experience was very enlightening and provided a real empathy with the problems of many of the people with whom they worked. Most responders indicated that they "enjoyed" the experience, although several questioned if a simulation of handicaps should be "enjoyable." Some indicated that there were too many handicaps in one individual, and others indicated that the experience should be more intense than it was.

Several insights and mofications came from this workshop. It was found that it took approximately 20 minutes to set up the simulation game, about 20 minutes to play and 10-15 minutes to debrief. The preparation and set-up time was thought excessive, and the following modifications were made: Have 2 people conduct the game--one orients the "teacher" to the nature of his/her role and demonstrates how to construct one tree while the other assists the "students" to become "handicapped." Cut grooves into one side of each "splint" (at three places) in order to accelerate fastening and to impede slipping. Cut off pieces of masking tape before beginning the workshop and put them on the edge of each table. Set sufficient "visual disability simulators" — string, rope, etc. — on each table prior to beginning the game.

March 15, 1976 - With 3 regular class elementary school teachers from the Buffalo Public Schools.

Feedback - Question 1: "Was the simulation exercise meaningful to you as a person?"
Yes 29
No 2

Question 2: "Was the simulation exercise meaningful to you as a teacher?"
Yes 26
No 5

Question 3: "Did you find the simulation exercise enjoyable?"
Yes 26
No 0
No Response 3
Meaningful 2

Again, written and verbal comments indicated the game was a meaningful and insightful experience for the participants. Here it was realized that the game could be played with a group of 30 participants. It was also learned that there could be from four to six members of each "classroom" in addition to the "teacher."

April 29, 1976 - With 36 graduate students in Elementary Education and Special Education. Again, enjoyment occurred and empathy for the handicapped was evidenced. Several recommendations for improving the experience were offered, such as the inclusion of cognitive tasks on various levels as well as other affective and psychomotor tasks. These are presently under consideration and may be implemented in the future.

Semifinal Product

The following will describe the current status of Up a Tree. Descriptions of the materials and process will be provided in that the nature of the game precludes forwarding a copy.

Materials Acquired to Date

Twenty-four boards each with three grooves cut into one side (splints)
Six pairs of plastic safety glasses with the lenses covered with two coats of rubber cement (acuity problems)
Six pairs of safety glasses with circles of masking tape (about 1" in diameter) covering the center of each lens (peripheral vision only)
Six pairs of safety glasses with lenses covered with masking tape except for a small opening (about ¼"-½" in diameter) in the center of each lens (tunnel vision only)
Two pairs of safety glasses with the lenses covered with masking tape
Ten plastic bags (Baggies) folded in half with six-inch strings attached to each side (acuity problems)
Thirty-six pieces of twine each about one foot long
Ten pieces of heavy rope each 2-3 feet long
Three large rolls of 1½ inch masking tape
Fifteen pairs of scissors (borrowed)
Ten Scotch tape dispensers with tape (borrowed)
Stacks of old newspapers

Current Game-Play Procedure

At present, one person (the "principal") can conduct Up a Tree, but an "assistant principal" is helpful. Ideally, before the participants arrive, tables (at least two) are arranged with four or five chairs placed around them. Tables are necessary and should be large enough so that four or five adults can work on an arts and crafts project. Depending on the number of players, the various safety glasses (and Baggies if necessary) are placed at each table (one for each "student") along with four "splints (enough for one person)," six pieces of twine, one length of rope, and five pieces of masking tape each about five inches long for each "student." The masking tape can be cut or torn and stuck to the sides of the table. At a corner of the room away from the tables where the players will sit (ideally, equidistant from the tables) is placed a large stack of newspapers, two pair of scissors for each "class" and two Scotch tape dispensers for each "class." These can be placed on tables, desks or on the floor.

The "teacher" for each "class" is then determined by: 1) appointment by the "principal," 2) selection by the "class," or 3) the participant who volunteers to be the teacher. The Teacher Role is then given to the teachers. If there is an "assistant principal," the teachers get together and, following the steps in the Teacher Role, construct one tree. While the "teachers" are determining their role, the "principal" instructs the "students" to: 1) put the "splints" on the arms of one "student," 2) wrap the masking tape around the thumb and index finger and the other three fingers on both hands for all "students" (some direct assistance by the "principal" may be necessary), 3) tie the legs together (at the knees) of one "student," 4) put on the visual disability simulators.

When the teachers return and the students are "handicapped," the "principal" provides the following orientation (or one with the same basic content): "I'm happy to see that all our classes are ready for work today. As you know, we are having our annual arts and crafts competition today. Your teachers have prepared a lesson which you all will enjoy. We will see which class is best in this arts and crafts activity. Each class will construct three trees. The class who can construct the trees the fastest and with trees that look the best will be the winner. Before we begin, I want to make sure that you are comfortable. If you are in pain or extremely uncomfortable, raise your hand and we'll come and help you. Also, if you begin to have pain or to become very uncomfortable during the game, raise your hand and your teacher or I will come and help you. Teachers, you can begin now--good luck."

The "principal" (and "assistant principal," if there is one) then step back and observe. They act as consultants to the teachers if they are needed. "Students" should be allowed to take off their visual disability simulator or exchange with someone with a different type of visual problem if they begin to get a headache or if their eyes hurt. The actual game-play should take about 20 minutes. Even though one "class" completes all three threes, five to ten extra minutes should be allotted for the others to finish. Those groups finished should throw away their scraps, return the scissors and tape and take off the tape, splints, rope, safety glasses, etc.

When all "classes" are finished and calmed down the "principal" announces the results of the "judging." With this game the objective is the process rather than the winning. Thus, all "classes" should be winners. During the game play the "principal" (and "assistant principal") should observe the nature of the functioning of each class so as to make some award to them! Awards given have included: "Fastest Tree Construction," "Best Looking Trees," "Most Creative Trees (almost anything call fall into this category)," "Most Cooperative Class," "Neatest Class," "Only Class Ever to Construct a Tree That Can Stand Alone," "Best Behaved Class," and any others that come to mind.

The debriefing then begins with the "principal" asking how the participants felt during the session. Emphasis is on relating the problems and feelings they experienced to the experiences of children and adults with disabilities.

FINAL COMMENTS

The following are thoughts and perceptions which, if categorized, could fall under the rubric of "miscellaneous."

1. Further refinement and revision are needed. Some of these include:
    a. Getting a more permanent method of simulating the fine motor coordination problems. Each game consumes a considerable amount of masking tape which is expensive. The thought contemplated is to sew together small pieces of Ace bandages (which are somewhat elastic) so that they could just be slipped over the fingers and could be reused.
    b. Establishing some type of auditory disability. The best way may be through cotton balls inserted in the ears. Again, these are consumable but are relatively hygienic and inexpensive.
    c. Implementing tasks within the game which require a variety of cognitive demands. Reading directions and/or trying to measure certain things by using a ruler or writing notes could be implemented to accomplish this.
    d. Developing activities and "lesson plans" that could be included or deleted depending upon how much time was available for playing the game.
    e. Consideration is still being given to incorporating some type of media into the game in the form of an audio tape, filmstrip, slides or combination of these.
2. The game is exciting and its development has been exciting--feedback has been extremely positive.
3. Many of the same principles and techniques can be extended for use with normal children in teaching them the acceptance of differences in other individuals--a preparation for mainstreaming mildly handicapped children.
4. The materials are somewhat troublesome to obtain, although most (splints, glasses, rope, etc.) are reusable. The only "expensive" items have been the safety glasses (Stewart Safety Glasses, The Douglas Stewart Company, Madison, Wisconsin, 53704). I was able to purchase these in quantities of ten for $1.00 each at the College Bookstore (they are usually $1.25).
5. I appreciate the opportunity provided me by the Center for Innovation in Teaching the Handicapped at Indiana University to conceptualize and begin development on this project.
6. I acknowledge the conceptual feedback and developmental and implementation assistance provided by Sharron Camp Allen who has spent many hours working on this project. I also thank Sivasailam Thiagarajan and Harold Stolovitch for their feedback and encouragement.

Up a Tree

Teacher Role

You are the teacher of a small class of exceptional pupils. Today you have planned an activity designed to develop the perceptual motor skills of the students, as they have a variety of perceptual and motor problems. An important part of your curriculum has been to train your students to become independent. Therefore, you will not provide any direct assistance to them during the lesson. Feel free to verbally explain what they are to do or even to demonstrate the task for them but do not provide direct help.

The lesson today involves having your students construct three paper trees. Lately you have been encouraging them to interact cooperatively so that you will be happy to see them cooperate in any way they wish during this lesson. The steps for making one tree are outlined below. You should familiarize yourself with these steps before beginning the lesson.

Step 1. Stack three of four opened double sheets of newspaper.

Step 2. Beginning at the long side of the newspapers, roll the sheets up so that the opening at both ends has a 1½ to 3 inch diameter.

Step 3. Beginning at the middle of the tube that has just been rolled, apply tape at the seam so that the tube will not open.

Step 4. Continue the taping process from the middle of the tube to either (only one) end.

Step 5. Beginning at the opening of the tube at the end where tape has not been applied, cut with scissors down the length of the tube to the point near which you began applying the tape (the middle).

Step 6. Continue step 5 until three to five parallel slits have been cut.

Step 7. Holding the taped end of the tube in one hand, begin pulling gently up on the cut sheets of paper until the "leaves" come out. Does the product in any way resemble a three? If so, you are finished with one tree.

In order to help motivate the students, a competition has been arranged between you and the other teachers. The first class to construct three trees (which must be judged acceptable by the "principal") will be the winner.

Evaluation Data from a Workshop Sponsored by
Buffalo Federation of Teachers

1. Was the simulation exercise meaningful to you as a person?

Yes 29 No 2

Was it meaningful to you as a teacher?

Yes 25 No 5

2. Did you find it enjoyable?

Yes 23

Comments:

OK (2)
Sort of.
Informative, not enjoyable.
Not enjoyable, but meaningful.
Comparatively.
Made me angry.

3. Was the workshop helpful to you?

Yes 27 No 2

If "Yes," which part do you feel was most helpful?

Simulation (8)
Encouraging "pupils" for successful completion of tasks.
Classroom demonstration where teachers were children.
Working as a handicapped person.
Helped to understand why children get frustrated because of handicap (3)
More insight to how handicapped people might feel. (5)
Realizing the challenge to teachers.
Emotional reactions to helping empathize with the handicapped.
Making the tree.
Aware of visual difficulties with the glasses.

4. Would you attend a follow-up workshop of related or similar activities?

Yes 23 No 5

Maybe 2 Probably 1

5. Do you have any suggestions for improving this workshop?

   1. Informal diagnosis
   2. Suggestions for working
   3. Simulate an auditory handicap
   4. In some way have people exhibit behavior problems and/or hyperactivity and ability to inhibit behaviors.
   5. With more time, other activities and areas of frustration could be explored.
   6. More about classroom alternatives with children.

7. More explanation of purposes of exercises.
8. A bit more information on the handicapped child in "normal" classes.
9. More varied activities.
10. Include other special needs.
11. Skip the first exercise.
12. More information on specifics. Also include emotional and other types of problems.
13. Perhaps discuss or role play a situation where only one in the group has a problem, and ways for teacher to help other children cope with disabled child positively.
14. If mainstreaming is going to be emphasized will we classroom teachers have true access to the ex. ed. teacher as a resource teacher?
15. Why doesn't the ex. ed. department in our school system provide training workshops for special subject teachers for familiarization and techniques (skills) sharing?

APPENDIX B

REPORT ON A TEACHER-TRAINING GAME DEVELOPED BY A PARTICIPANT IN THE FIELD-TEST WORKSHOP

Final Report: CITH Workshop -- Development of a Teacher-Training Game

Sue M. Kiniry, Participant

The following statements describe by module the activities and various stages through which a teacher-training game was developed.

Module 1:

A slide-tape presentation was viewed and explanations were given regarding the various tasks of developing teacher-training materials. This was essentially an orientation period.

Module 2:

Refer to page 4 of the module in which the following topic was chosen: Preparing teachers for sequencing learning tasks, particularly for preparing the smallest possible steps to use in programmed lessons, has been a difficult assignment in methods courses in learning disabilities. Task analysis must be applied and the learning task must be broken down into the many prerequisite skills necessary for success. Successively less difficult versions of the task must be sequenced into a learning hierarchy.

Refer to pages 6-8 in which a target population was described as follows: Most of the graduate students enrolled in LLD methods courses are generally familiar with the regular curriculum and have some experience in regular class teaching. Teachers who planned to be working in resource rooms with mildly disabled children were the primary target group.

Subject-matter competence

1. The trainees will likely have some previous exposure to the concept of task analysis, developmental sequences in curriculum, and the concept of task requirements.

2. They are expected to be graduate students who are generally certified teachers with experience in regular education.

3. They are likely to have several misconceptions regarding task analysis and sequencing small steps in learning:

a. They are accustomed to published materials and may feel that textbooks are written in appropriately small steps.

b. They may have difficulty thinking of the fluid steps that link the first to the second, etc.

c. They may be accustomed to teaching splinter skills rather than developmental sequences in difficult tasks.

d. They may not be accustomed to transfering earlier tasks into new tasks in which knowledge and experience are reintegrated and reinforced.

Attitude

1. Students may have difficulty viewing themselves as creators rather than users of materials.

2. There may be problems of re-orienting their perspective of "smallness" in sequencing steps.

Language

Students should have adequate vocabulary and GRE scores suitable for graduate work. They should have completed at least 6 semester hours in special education before entering the course in which the task is included. Generally, conversational language should be used.

Instructional Material and Equipment

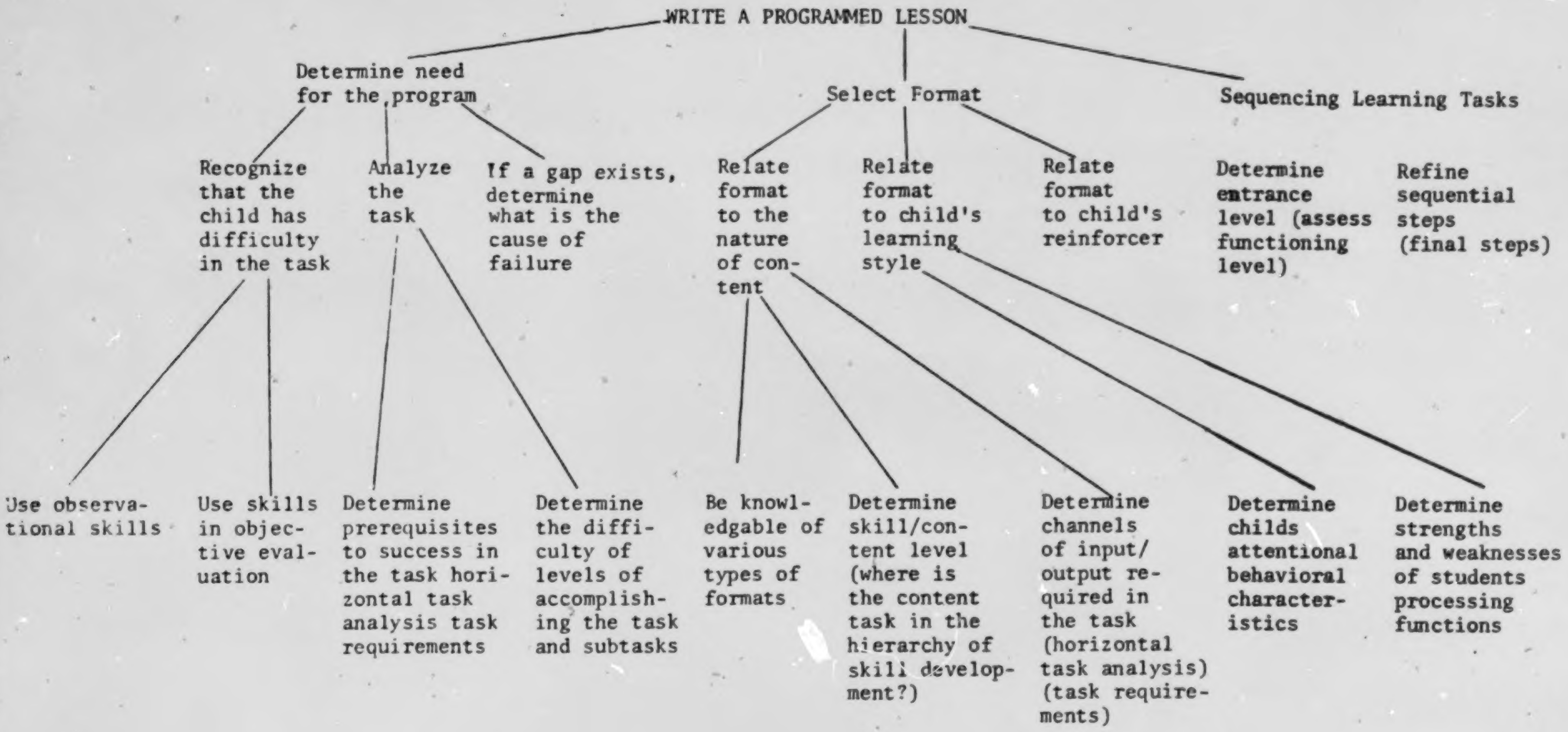
Students should have no significant deficits requiring special attention beyond the usual instructions for materials and equipment.

Module 3:

Refer to page 7 in which a task was chosen to teach graduate students to write a programmed lesson that: provides immediate feedback; is divided into small sequential steps; has a specific goal; has a specific scope, i.e., entrance and exit levels; and requires overt student response.

Refer to the assignment on page 10 in which the following task analysis was performed: (The task analysis is attached on page four.)

Refer to page 10 in which the following skills were selected as those needed by the trainee: In order to write a programmed lesson the student must be able to select a goal (exit level), determine an entrance level, relate content material to the most appropriate format for stimulus and response, and determine whether the teacher is needed for the formal style or whether the child can perform the tasks alone. The trainee must be able to perform in the following tasks: sequence learning tasks of the content, breakdown sequential tasks into extremely fine steps, be knowledgeable and/or experienced with a variety of format material, be knowledgeable of learner analysis to determine the need for teacher direction versus the learners ability to work alone, and be knowledgeable of learner reinforcers.



WRITE A PROGRAMMED LESSON

- Determine need for the program
  - Recognize that the child has difficulty in the task
    - Use observational skills
    - Use skills in objective evaluation
  - Analyze the task
    - Determine prerequisites to success in the task horizontal task analysis task requirements
    - Determine the difficulty of levels of accomplishing the task and subtasks
  - If a gap exists, determine what is the cause of failure
- Select Format
  - Relate format to the nature of content
    - Be knowledgable of various types of formats
    - Determine skill/content level (where is the content task in the hierarchy of skill development?)
    - Determine channels of input/output required in the task (horizontal task analysis) (task requirements)
  - Relate format to child's learning style
    - Determine childs attentional behavioral characteristics
    - Determine strengths and weaknesses of students processing functions
  - Relate format to child's reinforcer
- Sequencing Learning Tasks
  - Determine entrance level (assess functioning level)
  - Refine sequential steps (final steps)

Module 4:

Refer to page 6 in which a concept analysis was performed.

Critical attributes

1. provides immediate feedback
2. is divided into small sequential steps
3. has a specific goal
4. has a specific scope--entrance and exit levels
5. requires overt student response

Variable attributes

1. format--method of input
2. format--method of student response
3. media and/or audiovisual aids
4. self-instructional versus teacher-directed

Refer to page 8 in which the following nonexamples were generated:

1. (omit feedback) The child is asked to respond by writing the missing word on progressively more difficult examples in order to teach the concept of noun phrases.

2. (omit sequence) The child writes the missing noun in each sentence, illustrating the use of nouns as subjects. After each sentence he checks his answer with the guide on the right side of the paper.

3. (omit child response) The teacher shows the child increasingly more difficult examples of sentences in order to teach the use of noun phrases. The teacher repeats rules for using noun phrases while smiling and praising the child.

Refer to page 10 in which the following divergent examples were generated:

1. The teacher points to the sentence and nods yes or no after

each response as the child says the missing word in a series of increasingly difficult sentences designed to teach the concept of using noun phrases. (teacher variable)

2. The child writes the missing word in a series of increasingly difficult examples designed to teach the concept of the use of noun phrases. The teacher points approvingly or disapprovingly as each word is written. (type of response variable)

3. The child writes the word and checks each answer with the correct response given on the right side of the page in a series of increasingly more difficult examples of sentences designed to teach the concept of noun phrases. (self-instructional variable)

Module 5: "How to Develop Structured Roleplay Materials" was omitted.

Module 7: "How to Develop Audiovisual Training Modules" was omitted.

Module 6:

A teacher-training game was developed using the analyses of modules one through four. The original objective with which a task analysis was prepared (refer to page 3 of this report) was shortened to include one aspect of writing a programmed lesson. The objective of the game was to give the trainee practice in refining small sequential steps of classroom learning tasks.

The group of workshop participants assigned to module 6 skimmed various sets of game rules and played several games to review game designs. Through brainstorming sessions and collaboration with Dee Peters, the PEBBLES game was written, following the directions given in the module and according to the steps listed on page 26 of the module. Only the final copy is included in this report.

PEBBLES was written in experimental form and then played by a group of five workshop participants. Comments of the players were used to revise the game. At the close of the workshop PEBBLES was played in several groups by the entire workshop group. The directions again were revised for clarity and the game was published in the Spring, 1976 edition of Association for Special Education Technology Report. After additional use of the game with graduate students at Texas Tech University, it was revised again. The final revised version of the game follows.

PEBBLES: SMALL STEPPING STONES OF LEARNING

Published materials and teacher guides often leave gaps in sequences of learning skills in which LD and other exceptional children experience failure. It is the teacher who must bridge these gaps by providing simpler tasks within each step. Task analysis has often been applied to the failed task in which the child's entry level is determined and used as a base for building a hierarchy of increasingly more difficult tasks. The teacher must provide sequential steps of extremely refined tasks in which success is assured. This game is designed to give teacher-trainees experience in refining these steps.

Players

Five players have proven to be ideal for successful play and decision making. Three could also play, but larger numbers or even numbers of players should make joint decisions with one of the five players.

Play

1. Each player has a response sheet and a pencil. In the uppermost third of the sheet, each player writes a task. The task may be selected from task cards for beginning players. Advanced players may create tasks to fit their own interests. Each player should initial the task to avoid confusion.

2. Each player passes the response sheet to the player next to him in a clockwise direction.

3. In the lowest third of the response sheet (labeled Response 1) the player writes a task that is only one step more difficult than the original task. (Players should be reminded of the goal, which is to write a task as close as possible to the original task.) Each player initials the task and folds the bottom section of the response sheet backward so that his task selection cannot be seen by the next player.

4. Each player passes the response sheet to the player next to him in a clockwise direction.

5. The player receiving the response sheet reads the original task (Response 1 is covered) and writes a task that is only one step more difficult than the original task. (Again he should remember that the object is to get as close as possible to the original task, but still be a more difficult task.) The player initials his response.

6. Each player passes the response sheet to the player next to him in a clockwise direction.

7. The player receiving the response sheet acts as a judge and decides which response is closer, yet more difficult, than the original task.

Scoring

1. If there is no challenge, the player receives a point when the judge selects his response.

2. The player who wrote the response that was not judged to be the closer may challenge the judges decision and present his reasoning to the entire group of five players. Both players who wrote responses may present a case for their response as well as obtain any assistance from other members in the group. A group vote determines the closer response. The player who wins according to a vote of the group is awarded two points.

End of Play

Play continues for a prearranged period of time or a prearranged number of rounds. A minimum of five rounds should be allowed. The player with the highest score wins the game.

Comments

This game has been successful in helping graduate students to understand the concept of small steps as well as in developing steps to use in writing a programmed lesson. Directions have been expanded in detail after student testing showed the need for exact and smaller steps in learning the game.

APPENDIX C

REPORT ON AN AUDIOVISUAL TRAINING MODULE DEVELOPED BY A PARTICIPANT IN THE FIELD-TEST WORKSHOP

THE SELECTION OF MULTISENSORY MATERIALS FOR HANDICAPPED PRESCHOOL LEARNERS

RICHARDINE COMMITTEE

This report will attempt to outline the steps taken in the development of an instructional module for paraprofessional teachers of the handicapped. The module chosen was an audiovisual format that would assess the paraprofessional's ability to choose multimedia teaching materials to assist in their instruction.

RATIONALE

Before a decision could be made on the type of module to produce, it was necessary for the producer to survey the literature in order to see what materials had already been developed in this area, and to see whether there was any justification in producing this material.

Based on this search, there were no materials that had been produced in the area of special education for use by paraprofessionals in choosing multisensory material.

It was noted that, since 1965, the use of paraprofessionals in the field of special education has nearly tripled. This has been due to many factors. Among them has been the tremendous Federal support funds through such federal acts as Title 4 and Title 6-B, and litigation requiring all handicapped children to be educated.

Through the years, this writer has experienced great concern by teachers and paraprofessionals alike of a need for more information on the selection of multisensory materials and use of this material. It has been noted in the literature that these paraprofessionals who need information on the use of curriculum materials have ranged in both age, experience and duties. Their education has ranged from those with no high school degree to students who have graduated with teaching degrees and are unable to find a job in their field.

One common factor, however, that seemed to exist for any program that used paraprofessionals was that these people were responsible for a small group of children each day during an instructional period.

It was felt that this was a justification for this material.

LEARNER ANALYSIS

The majority of the learners that will use this module will not be certified in special education and will be using this module in an inservice workshop or course.

Subject-Matter Competence

The paraprofessionals level of knowledge and skills in the choosing and use of multisensory material will be very limited. Most will have a high school background, with very little background in the use of teacher-made materials or commercially produced materials. They will know little of the terminology used in the field.

Background Experience

Except for any material they have seen the teacher make or use, the paraprofessionals have no experience.

Major Misconceptions

The paraprofessional will have little skill in judging good and bad commercial materials in relationship to what the learning needs of their children might be. They will believe most commercial company statements on the usefulness of a particular material. Their own perceptions of their ability to use the material correctly will be limited. They will become very frustrated if the material does not bring instant success in helping the child learn the skill.

Attitude

The paraprofessionals will be very skeptical toward this module. They will prefer multimedia and small group instruction. They will prefer short sessions because their attention span will not be long. The specilized terminology will not be in their vocabularies. They will only have a superficial understanding.

Instructional Materials and Equipment

Fifty percent of the paraprofessionals can be expected to have a reading level of 7th-9th grade. Many of them may have a reading level less than that.

Handling of the materials and equipment will necessitate that any reading material will need to be carefully screened by readability level, interest level, and length.

CONCEPT ANALYSIS

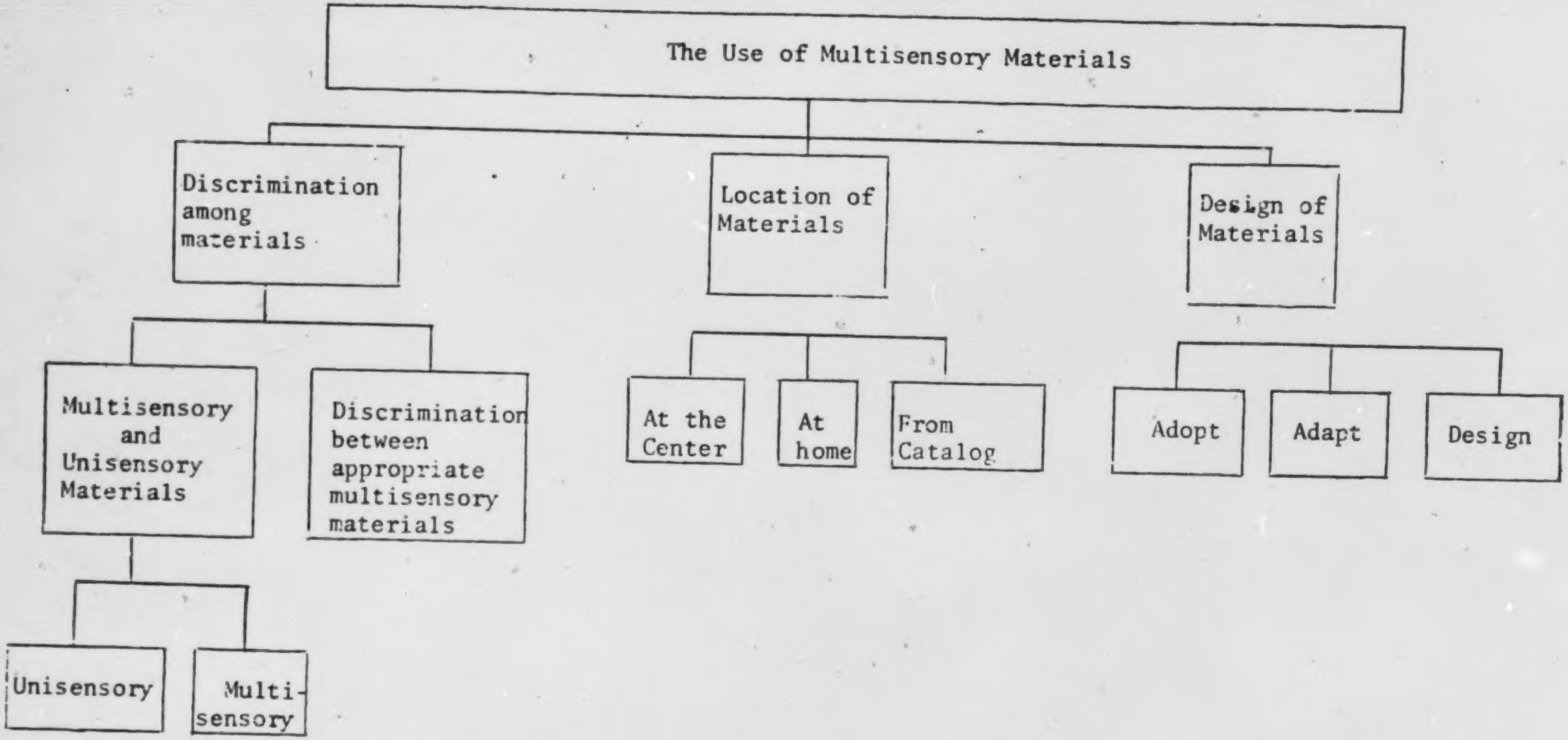
A concept analysis was done on the topic of the module. This resulted in the following:

Critical: Multisensory Materials

1. It is a material
2. It involves more than one sense
3. It is designed to teach

Variable:

1. It's form can vary
2. It involves two or more senses: visual, auditory kinesthetic, tactile, small or taste.
3. It is designed for one or more children (students)


The Use of Multisensory Materials
Discrimination among materials
Location of Materials
Design of Materials
Multisensory and Unisensory Materials
Discrimination between appropriate multisensory materials
Unisensory
Multi-sensory
At the Center
At home
From Catalog
Adopt
Adapt
Design

CRITERION ITEM

1. Go to your classroom and list in one column - materials that you know are multisensory - and in the other column - materials that you know are unisensory.

2. Take the Diagnostic Prescriptive Sheet and Descriptor Sheet on Commercially Prepared Materials:
   a. Choose one cognitive skill from the Prescriptive Sheet.
   b. Place a yes by each material on the Descriptor Sheet if it is appropriate to teach the skill you have chosen.
   c. Place a no by those materials that are inappropriate to teach the skill.

3. Compile a list of at least 10 multisensory materials that can be found in your center by interviewing:
   a. Other Paraprofessionals
   b. Media Specialist
   c. Other Teachers

4. Prepare a "materials box" of common objects/materials, that could be used as multisensory materials, and are found in your home.

5. Go through the catalog pages provided for you from the Vital Years and locate 5 multisensory materials. List them on the sheet provided.

6. Take a material already available in your center, given: (1) a description of a cognitive skill to be taught; (2) a description of a child. Determine if you can adopt it to your use.

7. Take a material available in your center, given: (1) a description of a cognitive skill to be taught; (2) a description of a child. Determine how you could adapt the material to your use by writing the changes you would make.

8. Take a group of raw materials and design a multisensory material, given: (1) a description of a cognitive skill; (2) the description of a child.

BEHAVIORAL OBJECTIVES

1. Discriminate between multisensory and unisensory materials found in a school.

2. Discriminate between appropriate and inappropriate multisensory materials to be used in teaching a cognitive skill.

3. Locate and list multisensory materials found at your center.

4. Locate multisensory materials at home.

5. Locate and list multisensory materials from a catalog.

6. Adopt multisensory materials for use with a specific child.

7. Adapt multisensory materials for use with a specific child.

8. Design multisensory materials for use with a specific child.

FORMAT AND MEDIA JUSTIFICATION

It was felt that a module in the "Use of Multisensory Materials" would need to take the form of an audiovisual module in order to provide a multisensory approach. It was also felt that due to the many limitations of the learner population, that this format would be best (see Learner Analysis section).

PRODUCTION

The production of this module was a very difficult task. Although the script had almost been completed before the workshop was completed, it was not realized how difficult it would be to complete the rest. It had taken the full three days at the work shop to write the task analysis, behavioral objectives and criterion items. One three-minute segment of the script was put on audiotape for self—appraisal and expert appraisal.

After the workshop was finished, the complete script was written. It was fairly easy to write, but it had to be revised four times, after rough recordings on a tape cassette, at the Charlotte Mecklenburg Media Production Center.

Spirit duplicating for the module booklet was decided upon due to fiscal restraints.

The visuals to accompany the script proved to be the most difficult of the process, mainly because of the writer's field-based status. Not having access to the University and its resources meant that the writer had to use the school system's media production experts, who were hard working, but overworked due to the large population they had to serve. The writer was also not able to get compensation for the materials, and that meant that it was impossible to allow the luxury of 10 shots per visual needed.

It was not difficult to find the subjects or materials to use in the visual shots, but it was very time consuming.

In fact, the photography part of the module delayed the project almost a month. It was not until the middle of April that the writer was able to have the slides for the module. This delayed both formative and summative evaluations.

It was extremely important to this writer to have the access to the Mecklenburg School Media Center. It was from this center that I received help on the photography section.

SELF-APPRAISAL AND REVISION

As indicated earlier, the first part of module was very difficult to arrive at successfully. The task analysis had to be switched several times before it reached its final form. The original topic had been; teaching pre-readiness cognitive skills to preschool mildly handicapped children by paraprofessionals. It was soon discovered that this topic was too broad. It was finally narrowed to; choosing multisensory material that would facilitate in the teaching of pre-readiness concepts.

There was seen in the graphic presentation of the task analysis a need for branching the subskill, "Discrimination Among Materials," into discrimination among unisensory and multisensory materials.

In the script writing, after parts were assigned to the readers, a voice analysis indicated a need to change some of the wording because of the difficulty in pronouncing alliterations placed in the script.

After placing the total script on a cassette recording, shortening of the material had to be done. The recording ran over 30 minutes, and it was felt that 20 minutes would need to be the goal. The spirit duplicating method was inexpensive, but it was difficult to read and, from hindsight, this writer feels that stencil would have worked better, or even the more expensive method of Xeroxing the original copy.

EXPERT APPRAISAL

At the workshop at CITH, the module received a great deal of expert appraisal. I had other members of the workshop read through the script and make suggestions. The word "paraprofessionals" was changed to teacher assistant, because it was felt that more schools are using this designation now. During the recording of the segment of the script at CITH, advice was given on the placement of words that sound similar and the avoidance of alliterations. At the Media Production Center in Charlotte, the media production director helped in the rewording of certain parts of the script so as to make it clearer and more crisp.

This writer then asked several teachers to look over the material. They made several suggestions. Some of these included indications that certain parts seemed to talk down to the audience, and that concepts were not given enough explanation. I had a curriculum specialist read through the script and review the visuals in order to determine whether the information was technically correct. The specialist was also asked for suggestions as to what multisensory materials, would be best suited (in terms of high visability and familiarty) for programs where the paraprofessionals worked.

Despite help from the Media Production Center, the visuals did not come out as well as expected. The lighting was poor, and the background shots were often overpowering and/or lacking in detail.

STUDENT TESTING

The producer of this module was only able to begin student testing at the end of the semester. An inservice course that she was teaching for the Center for Human Development in Charlotte, N.C. was used for the small group student testing. There were eight paraprofessionals and two uncertified teachers taking a methods and materials course.

The rough draft of the module book was duplicated by ditto and the first slides were used. These were done individually.

Based on comments received, the students felt the pace of the module was too slow and dwelt too long on location of materials. Not enough time was spent on the design of multisensory materials, which they felt was the crux of the problem.

The producer saw that the script would have to be changed to allow for this criticism. New visuals would need to be shot in order to compensate for the new length of the script in this area.

The script was rewritten, but the inservice course ended in the beginning of May, and no new inservice programs were scheduled until summer session. It was felt that the entire cycle needed to be done again.

FINAL EVALUATION

As indicated earlier, the summative evaluation has not been done. It is felt that the product needs to be seen by at least one more inservice group. This summer and fall the producer will be teaching another inservice course. It is felt that the final evaluation can be conducted at this time.

SCRIPT

There are so many materials available to teachers of mildly handicapped, preschool children that it is often difficult to choose among them.

It is important for you to recognize the differences between materials so that you can better choose for a child.

Materials for handicapped children come in different forms, but they can usually be broken into two distinct groups.

Materials that are unisensory-or use predominately one sense-and materials that are multisensory-or use two or more senses.

Children who are handicapped have been found to learn better through multisensory approaches.

Jane Byle is a teacher aide who is working with preschool children. She would like to begin using multisensory materials with her children - but she is unsure of how to pick materials. She has decided to talk to her Master Teacher in order to get some idea of how to do this –

Jane – Donna, I am still very unsure about materials to use with my children. Could you help me?

Donna – Sure. What exactly is it you want to know?

Jane – Well, I've heard you and the other teachers talk about multisensory materials, auditory materials, visual materials and so on. I'm not sure I know what you mean.

Donna – OK, Jane, that really can be confusing when you first start out. First, let me divide materials into two groups: unisensory and multisensory. Jane, see if you can name some of the senses you use yourself when learning new skills.

Jane – Well, I guess my eyes and ears.

Donna – Right. Those senses are called visual and auditory. Keep on, what else?

Jane – I don't know. Sometimes I learn things by writing them over and over. Is that using my eyes too?

Donna – No, not exactly. What you have mentioned is an entirely different one. It's called kinesthetic, or the use of muscles. What else? Can you think of another?

Jane – Well, I often learn about things by touching, tasting or smelling them.

Donna – Great! You have just given me the senses. Let's see if we can write them down on this blackboard-- Visual, Auditory, Kinesthetic, Tactile, Smell, Taste.

Donna – Now, let's see if we can find some materials in my room that can fall into these categories. Here is a horn. What sense would be involved here?

Jane – Your ears or auditory.

Donna – Right! This is a unisensory material. Let's try one more. Here is a "Feel and Scratch Board." What sense?

Jane – Well, this board has objects that you can both smell, touch, scratch and smell. It has to be more than just one sense.

Donna — That is good thinking. This material has both tactile, visual and smell elements. This material is called a multisensory material.

Donna — Can you tell me now the differences between unisensory and multisensory materials?

Jane — Multisensory means more than one sense, and unisensory means one sense.

Donna — That's exactly right. Let's see if you can find other materials in the classroom that can be divided into these two divisions.

------ While Jane is doing that, turn off the tape and survey your own classroom. Make a list of materials that you can use and place them in columns marked unisensory and multisensory material. After you have done this, check on Page 3 to see if the items on your list correspond with the elements of each item.

Being able to locate multisensory materials is just the beginning of learning how to use them appropriately. It is important that the material to be used matches the learner's needs in skill attainment.

Let's go back to Jane and Donna while they discuss picking appropriate materials.

Jane — I think I know the difference between unisensory and multisensory materials, but there are still so many multisensory materials to choose from, how do I know which one to use?

Donna — That is a very good question, and it's essential to good teaching. The first thing you need to know is just what am I teaching, or what skill does this child or group of children need.

Jane — Well, how do I get that information?

Donna — Normally I will tell you in my lesson plan what you will follow.

Jane — Oh, I know! You usually put on the lesson plan an objective for the child. Is that what you are talking about?

Donna — Right, that's just what I mean. Let's take a look at one your children might have. This is a prescriptive sheet, let's look at one of the skills.

Jane — Good, that will help me a lot.

Donna — Here is Tommy's sheet. On this sheet I have indicated that Tommy needs to work on naming the following common objects: Spoon, cup, plate, and fork. What senses would the material need to have?

Jane — Well, you would need the child to see the material, so I guess visual would be one sense.

Jane — Okay, what else. Well, I guess tactile, because if the child could feel it, he would learn it faster.

Donna — Exactly! Okay now what material would do this?

Jane — How about pictures from the Peabody Kit of those objects.

Donna — Will this allow the child to feel them?

Jane — No, I guess not, They are not three-dimensional. I guess I could use objects of forks, spoons, cups, like those found in the Fischer Price Kit.

Donna — That's in the right direction, but why not just use the real objects.

Jane — Sure, that would be good.

Donna — Let's take another skill and see if you can tell me what to use. Here is Bill's sheet. You pick an objective he needs to work on.

Jane — Let's see...how about telling the difference between up and down? In order to do this he will need to visually see up and down, and I guess he would need to physically go through the steps. Tactile and visual would need to be used.

Donna — That's a good analysis. Now what materials could you use?

Jane — Well, visually I could show pictures of objects that are up and down, and maybe I could have Bill follow those pictures. Or I could play a record with exercises that make you go up and down, and make Bill do this.

Donna — Those are good ideas.

------- Now that you have had a chance to discuss the importance of finding appropriate materials, let's see if you can take a skill and a description of a material and decide if it is appropriate or not.

Take your copy of the diagnostic prescriptive sheet and a list of materials. Mark "yes" by materials that could teach that skill, and "no" by those that could not be used.

When you have finished turn the tape back on.

Once you know the skills your children will need, it will become necessary to locate the appropriate material.

There are three places you can use to begin your search. Let's follow Jane as she visits these.

The first place Jane tried was the classroom next to hers. She talked to the other teachers and teacher aides to see if they had materials. After she talked to them and got an idea of what they had, she visited the media center.

Here she talked to the media specialists, who showed her the card file of multimedia materials available to her. She got many good ideas from there.

The last places she visited were her home and a few local stores. In the kitchen she found materials to use for taste and tactile materials. She also found bells, pots and pans that could make good auditory material. In her sewing room she found fabric that could be used for tactile materials. In her living room she found magazines that could provide visual material. In the stores near her home there were many other materials she could get.

Turn off the tape now and do the following. Interview other teachers and teacher aides in the school. Find out what materials they have that would be appropriate to use. Go to the media specialist and obtain a list of films, filmstrips, or other manipulative materials that would be appropriate.

Tonight go home and prepare a materials box that will contain materials that can be used to teach auditory, visual, kinesthetic, tactile, taste and feel skills.

Use the questionnaire sheet on page 6. Turn the tape back on after you have done this.

Often you will find that you will not be able to locate materials at school or at home. It will then be necessary to use a catalog to order materials. Let's see how Jane approaches this problem.

Jane — Donna, I have a problem. Tommy can't distinguish different itensity of sounds; for instance, things that are loud and soft. I have looked at school and at home, and I can't think of materials to help me. What can I do?

Donna — Well, let's see if some of the early childhood catalogs I have will contain some materials that we can order to teach that skill.

Donna — Here's a catalog. Jane, what senses would we be working on in that skill you mentioned?

Jane — Mainly auditory and maybe visual and tactile.

Donna — Okay, let's look at the catalog and see if we can find anything.

Jane — How would we decide how and where to look?

Donna — Usually your catalogs will be divided under sensory areas, and you can look there. Let's look under auditory discrimination and see if we can find anything.

Donna — Look, there are a lot of materials here. And there is a set of materials that helps a child distinguish differences in fine sounds. Looks like it might help us.

------ Turn off the tape now, turn to page 7 and complete that page. After you have finished, turn the tape back on.

It will often be necessary, once you know what skills a child needs, to make three decisions. You must make these decisions in order to maintain the appropriateness of the material.

The first is: This material fits the needs of my child. There is no need to make any changes. I can simply adopt an already existing material.

Quite often, however, in special education you will have children that will have certain needs that the normal commercial material cannot meet. You may have children who are visually handicapped, and the flashcards you want to use are not large enough. Then you will need to adapt your material — decision number two. You might have a child that has cerebal palsy. The child will not be able to hold the material in his hand. Again, adaptions will need to be done.

Thirdly, it is also possible that you will need to completely design your own material when you can not locate what you need. Adoption is of course the easiest of the three.

Adaption is a relatively harded task. It is necessary to outline the elements of the commercially available material that need to be changed after an analysis of the learner is conducted. It then becomes necessary to decide if the actual format of the material needs to be changed; if something needs to be added to the format to facilitate learning, or the directions in the use of the material need to be modified.

Let's watch as Jane attempts to adapt a material she has available to her, but one that does not meet the abilities of her student.

Jane - I want to use these Peabody pictures, but Brenda has severe spastic cerebal palsy. Donna, how can I do this?

Donna - Well, what exactly is the problem?

Jane - I'm trying to get her to verbally name objects that appear in the cards, but her arms keep knocking the material off the desk. And that disrupts the whole lesson.

Donna - Well your problem appears to be how to keep the material securely attached to her desk. What could you do?

Jane — Well, I guess I could either tape the pictures down, or I could place them in card holders that are firmly attached to the desk or to the wall.

Donna — Excellent idea. Now do it.

------- Turn off the tape now. Pick a skill that one of your children needs to work on. Find a material that could be used to teach that skill, but one you need to change.

Fill out the questionnaire on page 9 after you have done this.

If you cannot find a material that works, or you cannot adapt, then the last choice you have is to design your own. This is probably the most challenging of the three decisions.

The first thing you will need to do is to decide what skill you are going to teach. If you search for materials at school, in the community or through catalogs, and you still can't locate one, then you must design your own.

You should write the skill out on a piece of paper. Then you should write down the elements that your material should have to teach this skill. The next thing you need to do it to list the format your material will take. A list of the raw materials you will need should be formed. Include construction paper, any tools needed to make it, or other raw materials. Write down any directions that would help another person design their own material.

Let's follow Jane as she attempts to make her own material.

Jane wants to help a child to know her brothers and sisters by sight, and to be able to call them by name.

The first thing Jane does is to write the skill down that she wants to teach to the child.

After she has done this, she looks at what elements she will need. She knows she will need to use visual senses, and she would like to use auditory senses also.

She decides that she will need a recognizable picture from each member of the child's family. She will make up a scrapbook of these members. She also decides to make a tape recording of each of the members saying something to the child. That way she can combine the sound and picture of the family member, and she hopes this will increase the ability of the child to remember the family member's name.

She writes down exactly how she did this, in case someone likes her idea, and wants to use it.

Now that you see the steps that are necessary to adopt and design your own material, turn off this tape and finish the last assignment of this module. You should now be able to pick and use appropriate multisensory material for use with handicapped children.

RESPONSE BOOKLET

INSTRUCTIONAL DEVELOPMENT
FOR TRAINING
TEACHER ASSISTANTS OF
EXCEPTIONAL CHILDREN

MODULE 1 - THE SELECTION OF
MULTISENSORY MATERIALS
FOR HANDICAPPED PRESCHOOL CHILDREN

Script:	RICHARDINE CONNELLEE
Visual Design:	BARNIE LISK
Photography:	MICHAEL MCCOY
Audiotape:	BARNIE LISK
Package Design:	RICHARDINE CONNELLEE

FIELD - TEST VERSION ONLY

NOT FOR GENERAL DISTRIBUTION

Objectives

Upon completion of this module, you will be able to appropriately use multisensory material in the instruction of your children.

Specifically, you will be able to do the following:

(1) Discriminate between multisensory and unisensory materials by listing those found in your school or center.

(2) Discriminate between appropriate and inappropriate multisensory materials to be used in teaching a cognitive skill.

(3) Locate and list multisensory materials found in your center or school.

(4) Locate and choose multisensory materials from home.

(5) Locate and list multisensory materials from a catalogue.

(6) Adopt a multisensory material when given a specific skill and description of a child.

(7) Adapt a multisensory material when given a specific skill and description of a child.

(8) Design a multisensory material for use with a specific child.

PLEASE START THE TAPE

Materials Found in Your Classroom

Unisensory	Multisensory
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

PLEASE START THE TAPE

3

Check the following questions and see if the materials you placed under multisensory can meet the following criteria.

	Yes	NO
1. Is your material a material?		
2. Does your material involve more than one sense?		
3. Is it designed for teaching or can it be used in teaching?		
4. Can the form of the material vary?		
5. Does it involve at least two or more of the following senses in its designed use: visual, auditory, kinesthetic, tactile, smell, taste?		

If you were able to answer yes, then your materials are correct.

RETURN TO THE TAPE

4

Diagnostic Prescriptive
Sheet - Language Development

Name Tommy P. **C.A.** 4-3

Developmental Age, 2-4 **Date of Assessment** Mar. 26, 1976

On March 21, 1976, Tommy P. was assessed in the area of language development, using the Learning Accomplishment Profile. He obtained a Developmental Age of 2-4 with the following areas found to be needing remediation:

1. Ability to name the following objections: Ball, pencil, scissors, cup, watch, hat.
2. Association with the following questions - what do you hear with? what do you cook on?
3. Understanding the concept of one.
4. Ability to say full name when asked.

DIRECTIONS: You are to choose one of the skills above and indicate yes or no on the sheet provided for you in this module with the listing of various multisensory materials for the handicapped.

PLEASE START THE TAPE AGAIN

5

Name of Skill Chosen ______________________________________

The following materials from the List of Multisensory Materials would appear to be appropriate from the description given of the material.

1.

2.

3.

4.

5.

6.

Now have one of the members of your faculty check your list.

PLEASE START TAPE AGAIN

QUESTIONS TO ASK PERSONNEL AT SCHOOL

1. Do you have any multisensory materials?

2. Could you list them below by their catagories?

Auditory-Visual	Visual Tactile	Auditory-Kinesthetic	A-V K

3. Could you list any others you might have?

PLEASE START THE TAPE AGAIN

Directions: Go through the copy of THE VITAL YEARS provided with this module. List five multisensory materials from this catalogue onto the purchase order below.

INSTRUCTIONS: Detail specification, when applicable, to be submitted below or on an attached sheet. Show manufacturer's name and catalog number. When ordering repair parts give make, model and serial number of equipment for which parts are needed. Where applicable, give required voltage, phase, and cycle for electrical equipment. Where applicable, indicate desired color.

SHIP TO :	SUGGESTED VENDOR:
	ADDRESS:

ITEM DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL PRICE

8

Cognitive Skill: The child will be able to distinquish between objects that are rough and those that are smooth.

Description of Child: Mildly retarded preschool child. M.A. 2-6 C.A. 4-0. No sensory deficits.

Describe Material that can be adopted from your classroom.

Check List to be Answered:

1. Did you have to change the basic materials or format?
2. Did you have to add any modifications?
3. Did any directions need to be changed to facilitate use of the material?

If you answered no to all the questions, then your material could be adopted.

PLEASE START THE TAPE AGAIN

Cognitive Skill: The child will be able to carry out a three-part direction requiring understanding of the following prepositionals: ON OFF UNDER ABOVE. For example: Put the block under the book, sit on the chair, put your hands above your head.

Description of Child: Multiply handicapped non-ambulatory visual handicaps. C.A. 5 M.A. 2-8

Complete the Following: I had to change the format of the material to be used in the following way ______________________

____

I had to add the following modifications to the already existing elements of the material ______________________________

I had to change the directions for the use of the material in this way

____

If you had to do any of the above you had to adapt the material.

START THE TAPE ONE MORE TIME

Cognitive Skill: The child will be able to name the following coins: dime, penny, nickel

Description of Child: M.A. 4.0 C.A. 6.0 Legally blind, cerebal palsy.

Please Complete the following:

List of the Skills to be taught.

What sensory elements are needed?

List of materials needed to teach skill.

Written directions on how to make materials and use them.

Evaluation Questionaire

Directions: After you have completed the module would you please answer with all frankness the following questions.

1. Were the objectives of the module clear to you? Please comment.
2. Were the assignments required of you relevant?
3. Were the slides clear? If not, which ones were confusing?
4. Were you able to learn from the instructional content?
5. Was any of the content trivial?
6. Was any of the content too difficult without adequate examples?
7. Did you have enough practice and review?
8. Did you notice any errors in the booklet accompanying the module?
9. Was the style of presentation appropriate?
10. Did you receive adequate feedback?

APPENDIX D

REPORT ON ANOTHER AUDIOVISUAL TRAINING MODULE DEVELOPED BY A PARTICIPANT IN THE FIELD-TEST WORKSHOP

Redirection of Individual Instruction

FINAL REPORT

Carole E. Stowitschek

Rationale:

Special education teachers in the Nashville Metropolitan area are faced with a problem common to many school systems. This problem is the considerable deficit in textual materials and resources that adequately cope with the educational needs of their students. Student abilities range so broadly within special education classes that a variety of instructional materials and procedures must be relied upon by the teacher. The daily decisions that are required of a teacher regarding materials and techniques can become overwhelming. Although it is not possible to remedy all the problems that these teachers face, assistance can be given by helping them to systematically coordinate their employment of various materials, progress measures and teaching techniques.

Learner Analysis:

Appropriate subjects for this module are pre- or inservice special education teachers. The population may be expected to include teachers who do not look favorably upon progress-testing and record-keeping procedures and who are not proficient in charting percentages or frequencies of performance.

Behavioral Objectives:

This module was designed to train teachers to rediagnose student performance difficulties, and to reassign students to appropriate materials and/or teaching techniques (more specific objectives may be found on page 1 of the response book).

Format and Media Justification:

A slide-tape, response book format was chosen for several reasons:

(1) CITH felt the format was appropriate for the topic, (2) slide-tape equipment is commonly available in almost any school system and, (3) this type of module may be used by either a group of teachers or by an individual teacher.

Production:

Production of this module began with a task analysis of the original problem. Next the response book and finally the script were written. At this point the materials were read and critiqued by a special education faculty member and revisions were completed.

Slides and an audiotape, produced by media personnel at Peabody College, were evaluated by one student who viewed the slides and completed the response book. At this point we felt the product was ready for a tryout. A final evaluation was completed using 11 preservice teachers. Final revisions were completed based on the field-test information, a critique by a CITH staff member, and self-appraisal of the module.

Self-appraisal and revision:

The major modifications between the initial task analysis and final product was to narrow the scope of content included in the module. Specific techniques were employed for assigning performance levels and redirecting student instruction. Many minor changes were made as the module development progressed until the final draft was completed. These changes ranged from redesigning the Individual Instruction Profile to correcting grammatical errors in the response book. (The original and final task analyses are included)

Expert Appraisal:

The first draft of the script and response book were evaluated by a faculty member at Peabody and a CITH staff member. Their suggestions included additions to the response book, such as restatement of main points, more exercises and references. Final revisions were based on field-test results.

Student testing:

One undergraduate special education student read the script and completed the response book. The only changes resulting from this evaluation were clarification of script wording and changes in page numbers.

Final Evaluation:

A field evaluation of the module was conducted with eleven preservice teachers who were enrolled in an undergraduate special education materials course at George Peabody College. All of the students were volunteers. Four students completed the module, as a group, in a one-hour period. Seven students served as controls during the same time period and did not complete the module. A posttest design was employed because of potential practice effects that may occur as the result of administering a pretest.

Following completion of the module, participants attained an average test score of 15.5 (86%) as compared to an average of 9.7 (54%) attained by students who did not complete the module. The difference between the groups was significant ($U = 1.5$, $p < .01$) in favor of the module participants. All participants met criterion (80%) and one control student demonstrated criterion performance on the posttest. This student was enrolled in the graduate program and had completed a procedures course that included criterion-referenced progress monitoring in its content.

The participants rated the value of the presentation at 3.25 on a scale of 1-5, 5 being the highest value. Degree of interest was rated at 3.5. The subjects felt that the procedure and continued progress checks were most useful but found the flow chart difficult to use.

Revisions were completed based on these criticisms.

REDIRECTION OF INDIVIDUAL INSTRUCTION

Response Book

S[illegible]ervision: Joseph J. Stowitschek
Harold Stowitschek

Development: Carole E. Stowitschek

George Peabody College for Teachers
Nashville, Tennessee

FIELD-TEST VERSION: NOT FOR GENERAL DISTRIBUTION

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Module Objectives

Upon completion of this module the learner will be able to redirect unsuccessful academic performance of students by doing the following:

1. Record daily student performance by (a) checking correct and incorrect items, (b) converting score to percent correct, (c) recording percent score on individual profiles.
2. Rediagnose student prescription by (a) checking recorded percent score, (b) assigning performance proficiency level according to achieved percent

Mastery level	90-100%
Drill level	60-90%
Remediation level	less than 60%

3. Assign appropriate maintenance schedule when 90-100% proficiency is maintained.
4. Assign appropriate practice or innovative activities when 60-90% proficiency is maintained.
5. Conduct tutoring sessions when less than 60% proficiency is maintained.
6. Reassign students to continue to monitor and perform different levels when percent scores indicate a change of current status.

WHEN YOU FINISH STUDYING THE OBJECTIVES, PLEASE RETURN TO THE TAPE.

INDIVIDUAL PROGRESS RECORD

Student ______________________ Teacher ______________________

Subject ______________________

Date	Assignment	Possible Correct	Actual Correct	Per cent Correct

SAMPLE ASSIGNMENTS

Directions:

1. Check each of the assignments for correct and incorrect answers.
2. Record the number of correct answers over the number of possible answers in the blank score section, (e.g. Score 5/12).
3. Complete the Individual Progress Record Form on page 6 as completely as possible using the information given to you on pages 3-5.
4. Compute the percent score for the five days of records.
5. Using the flow chart on page 7, select a performance level and record it in the blank space.

Subtraction Facts

Student Josh Score $\frac{\quad}{12}$ = ____%

4/10/76

1. 7 - 3 = $\boxed{4}$
2. 4 - 1 = $\boxed{3}$
3. 9 - 8 = $\boxed{3}$
4. 6 - 3 = $\boxed{3}$
5. 8 - 1 = $\boxed{7}$
6. 9 - 0 = $\boxed{0}$
7. 8 - 5 = $\boxed{3}$
8. 9 - 4 = $\boxed{4}$
9. 8 - 2 = $\boxed{6}$
10. 7 - 4 = $\boxed{3}$
11. 6 - 3 = $\boxed{3}$
12. 2 - 0 = $\boxed{0}$

Subtraction Facts

Student Josh

4/11/76

Score $\overline{12}$ = %

6 - 4 = $\boxed{2}$

3 - 2 = $\boxed{1}$

9 - 9 = $\boxed{9}$

5 - 4 = $\boxed{1}$

7 - 2 = $\boxed{5}$

8 - 1 = $\boxed{7}$

7 - 6 = $\boxed{1}$

8 - 5 = $\boxed{3}$

9 - 3 = $\boxed{3}$

7 - 5 = $\boxed{2}$

6 - 4 = $\boxed{2}$

1 - 1 = $\boxed{1}$

Subtraction Facts

Student Josh

4/12/76

Score $\overline{12}$ = %

5 - 3 = $\boxed{2}$

2 - 1 = $\boxed{1}$

8 - 8 = $\boxed{8}$

5 - 3 = $\boxed{2}$

6 - 1 = $\boxed{5}$

7 - 0 = $\boxed{0}$

8 - 7 = $\boxed{1}$

9 - 6 = $\boxed{3}$

9 - 4 = $\boxed{4}$

8 - 6 = $\boxed{2}$

7 - 3 = $\boxed{4}$

2 - 2 = $\boxed{2}$

Subtraction Facts

Student Josh

4/13/76

Score $\frac{\quad}{12}$ = %

7 - 6 = 2

5 - 5 = 1

6 - 1 = 5

0 - 0 = 0

3 - 1 = 2

8 - 2 = 6

8 - 3 = 5

4 - 0 = 0

9 - 5 = 4

6 - 5 = 1

7 - 4 = 3

9 - 6 = 3

Subtraction Facts

Student Josh

4/14/76

Score $\frac{\quad}{12}$ = %

7 - 7 = 1

1 - 0 = 0

9 - 8 = 0

4 - 1 = 3

5 - 2 = 3

9 - 6 = 3

3 - 3 = 1

5 - 4 = 1

8 - 6 = 2

7 - 5 = 2

2 - 1 = 1

6 - 3 = 3

INDIVIDUAL PROGRESS RECORD

Student ____________________ Teacher ____________________

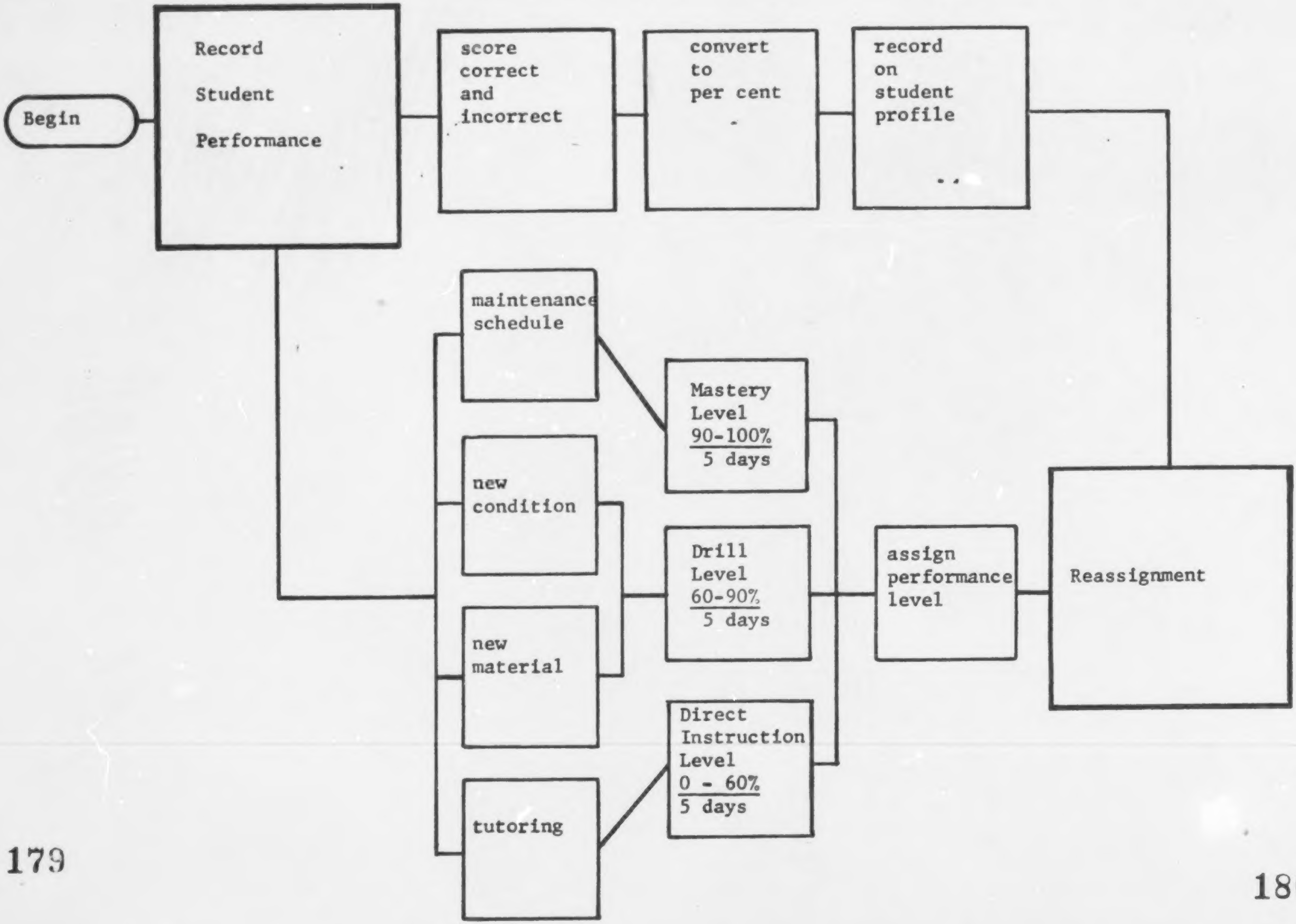
Subject ____________________

Date	Assignment	Possible Correct	Actual Correct	Per cent Correct

Average percent score ______________

REDIRECTING INDIVIDUAL INSTRUCTION PROFILE

This flowchart shows the steps you take in establishing an individual progress record and setting up a redirection plan. Select the level the student is at (Mastery, Drill or Direct Instruction) and enter it in the space at the bottom on page 6.


Begin
Record Student Performance
score correct and incorrect
convert to per cent
record on student profile
maintenance schedule
new condition
new material
tutoring
Mastery Level 90-100% 5 days
Drill Level 60-90% 5 days
Direct Instruction Level 0 - 60% 5 days
assign performance level
Reassignment

INDIVIDUAL PROGRESS RECORD

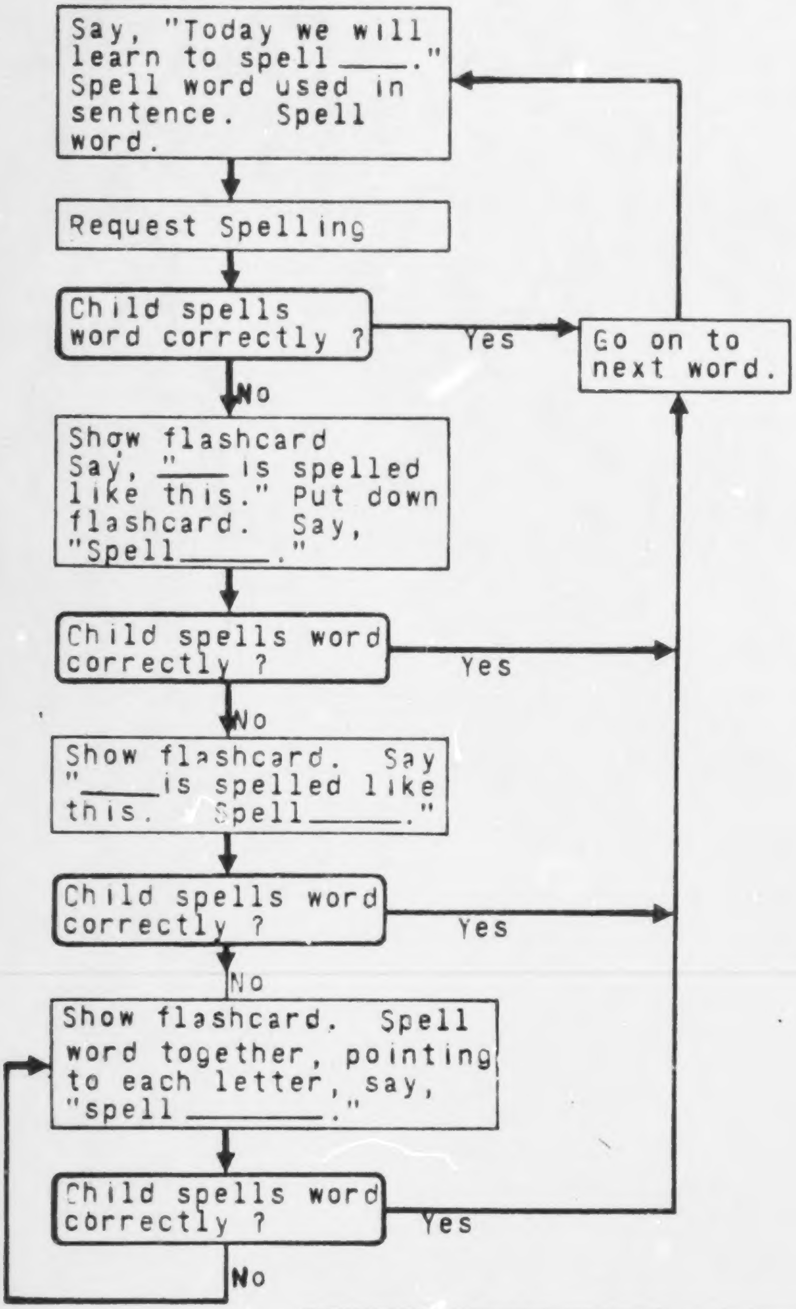
Student Vickie

Teacher Mrs. Lewis

Subject Spelling

Date	Assignment	Possible Correct	Actual Correct	Per cent Correct
3/17	Teacher Selected List	10	3	30%
3/18	"	10	3	30%
3/19	"	10	5	50%
3/22	"	10	4	40%
3/23	"	10	6	60%

Oral Spelling Flowchart


Say, "Today we will learn to spell ____." Spell word used in sentence. Spell word.
Request Spelling
Child spells word correctly ?
Yes
Go on to next word.
No
Show flashcard Say, "____ is spelled like this." Put down flashcard. Say, "Spell ____."
Child spells word correctly ?
Yes
No
Show flashcard. Say "____ is spelled like this. Spell ____."
Child spells word correctly ?
Yes
No
Show flashcard. Spell word together, pointing to each letter, say, "spell ________."
Child spells word correctly ?
Yes
No

Tips for Teachers
Module 19: Desigining Tutoring Materials

For Information write to :

Center for Innovation in Teaching the Handicapped
School of Education
Indiana University
Bloomington, Indiana.

INDIVIDUAL PROGRESS RECORD

Student Jim Smith Teacher Mrs. Lewis

Subject Subtraction Facts

Date	Assignment Series Name	Possible Correct	Actual Correct	Per cent Correct
3/2	p. 17	15	9	60
3/3	p. 18	15	11	73
3/4	p. 20	15	10	66
3/5	p. 21 - 22	25	19	70
3/8	p. 24	25	16	60

Directions:

1. Examine the record form, then turn to page 7. Select the performance level and assignment most appropriate for this student. Discuss you rationale for the selection.

performance level ____________ assignment ____________

rationale: ____________

2. What additional facts would you examine when selecting a reassignment for your student?

This completes the slide-tape presentation for the Redirection of Individual Instruction.

By now you should be able to do the following tasks:

1. Record student performance according to percent correct.
2. Reassign according to percent scores over a five-day period by the following.

   Mastery Level - 90 - 100%

   Drill Level - 60 - 90%

   Remedial Level - less than 60%

3 Reassign students when current status changes.

If you wish to evaluate your cognitive grasp of the contents of this module, complete the Self-Evaluation Form on page 12, then check your responses with those on the page following the evaluation.

SELF-EVALUATION FORM

Frances usually performs at grade level but is having difficulty with multiplication facts. She seems to understand the concept involved with multiplication but has not progressed beyond the threes in her time tables after two weeks of assigned seatwork on multiplication problems up to and including the threes.

Mr. Black, the teacher, conducted probes over a one week time period. Frances scored 0, 2, 0, 4, 3, correct out of ten orally presented problems for each probe. As one can tell from the figures, slight improvement occurred over and above this academic improvement. Frances appeared to enjoy the attention.

Complete the following Individual Progress Record, then choose a performance level and make an assignment. Use the Rationale section to explain why you made that assignment.

INDIVIDUAL PROGRESS RECORD

Student ____________________ Teacher ____________________

Subject ____________________

Date	Assignment	Possible Correct	Actual Correct	Per cent Correct

____________________ (performance level)

____________________ (assignment)

Rationale:

____

____

____

____

SELF EVALUATION FORM

Frances usually performs at key grade level but is having difficulty with multiplication facts. She seems to understand the concept involved with multiplication but has not progressed beyond the threes in her time tables after two weeks of assigned seatwork on multiplication problems up to and including the threes.

Mr. Black, the teacher, conducted probes over a one week time period. Frances scores 0, 2, 0, 4, 3, correct out of ten orally presented problems for each probe. As one can tell from the figures, slight improvement occurred over and above this academic improvement. Frances appeared to enjoy the attention.

Complete the following Individual Progress Record then choose a performance level and make an assignment. Use the rationale section to explain why you made that assignment.

INDIVIDUAL PROGRESS RECORD

Student Frances Teacher Mr. Black

Subject' multiplication

Date	Assignment	Possible Correct	Actual Correct	Per cent Correct
—	probe	10	0	0%
-	probe	10	2	20%
-	probe	10	0	0%
-	probe	10	4	40%
-	probe	10	3	30%

remediation level
(performance level)

direct tutoring
(assignment)

Rationale:

A student who functions at such a low level needs direct one-to-one tutoring [illegible] as she does not understand the concept and has been taught.

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